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EMAIL RECORD KEEPING IN THE
GOVERNMENT SECTOR:
A CASE STUDY OF MALAYSIA

SITI KHAIRUNNISA
SHEIKH ABDUL MUTALIB

PhD

2018

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SHEIKH ABDUL MUTALIB

A thesis submitted in partial fulfilment of
the requirements of the University of
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of Doctor of Philosophy

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Department of Computing and Information
Sciences, Northumbria University

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Abstract

Email has become the main means of correspondence, displacing the letter with its conventions and procedures developed over centuries. Every organisation needs to develop and implement policies to manage email as records of evidence of transactions and as a source of information. This study aimed to critically explore the management of email in the context of the management of information and record keeping in the transition to the digital. The objectives of the study were: To explore the legal and regulatory environment in relation to the Malaysian Government and the information it creates and holds; to explore the evolution of email recordkeeping by the Malaysian Government; to critically review existing policies, guidelines and systems for capturing and managing email by the Malaysian Government from a record keeping perspective; and to investigate the current practices in managing email in a selected part of the Malaysian Government against existing policies and guidelines, in part to determine if the latter were clear and unambiguous. It highlights the fact that no in-depth case study of email management has been published previously.

In the public sector there are many examples of poor email management. For instance, Michael Gove, when UK Secretary of State for Education, conducted government business using his wife's personal email account; and former US Secretary of State Hillary Clinton used a personal email account and server for both government and personal business. The context of this thesis is the introduction by the Malaysian government of a project that will provide a free email account for every citizen over eighteen to allow them to access e-Government services through a single sign-on user ID, as part of the move to e-government in Malaysia to deliver its Vision 2020.

The research is based on a case study of the implementation of this initiative and the accompanying system for managing email at a selected government ministry in Malaysia; it is based on interviews with twelve participants with different roles across three departments and the two providers of policies and guidelines. The design of interview questions was based around the records continuum model and is four elements, the creation, capture, organisation and pluralisation of information.

The findings suggest that email has been accepted by the government as records and evidence mandated by Malaysia's *National Archives Act 2003*. Yet not all government servants accept emails as records, largely as a consequence of poor project planning and faulty design of the Digital Document Management System (DDMS) for email management. The DDMS has been developed to ensure that the government manages its email, and other electronic records, according to international standards embodied in ISO 16175:2 (2011), which has been adopted nationally as MS ISO 16175:2 (2012).

The main factors influencing the implementation of the DDMS in the government sector are people, processes and technology. The DDMS project has been seen as an IT project, and not a records management project, and consequently has failed to meet the requirements for a digital records management system. This explains why some government servants are reluctant to accept email as a record.

Project management, change management and quality management should have been central during the system implementation process, but were found to be either

inadequately addressed or completely overlooked. The findings conclude that email management can be markedly improved by promoting information culture and awareness of the importance of managing email records.

This case study contributes to the evolution of record keeping policy and practice in a former UK dependency during the transition to the digital environment and in the identification of good practice that could be applicable in other similar national government contexts.

Keywords: Email Management, Email Record Keeping, Record Keeping Systems, E-government, Malaysia

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Again, Thank You.

Author's declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work. I also confirm that this work fully acknowledges opinions, ideas and contributions from the work of others.

Any ethical clearance for the research presented in this thesis has been approved. Approval has been sought and granted by the Faculty Ethics Committee / University Ethics Committee / external committee on March 14, 2016.

I declare that the Word Count of this Thesis is 67, 354 words

Name: SITI KHAIRUNNISA SHEIKH ABDUL MUTALIB

Signature:

Date: 25 JUNE 2018

List of Abbreviations

BERNAMA	Pertubuhan Berita Nasional Malaysia / Malaysian National News Agency
CCI	Communications, Content and Infrastructure
CMMI	Capability Maturity Model Integration
DDMS	Digital Document Management System
DTI	Department Trade and Industry
ERMS	Electronic Records Management Systems
EDMS	Electronic Document Management Systems
e-government	Electronic Government
EU	End User
ETP	Economic Transformation Programme
ELE	Electronic Labor Exchange
EPU	Economic Planning Unit
EGSC	e-Government Steering Committee
EPP	Entry Point Project
GOE	Generic Office Environment
HPRM	Hewlett Packard Records Management
HRMIS	Human Resources Management Information Systems
ICT	Information Communication and Technology
IT	Information Technology
IW	Information Worker
INTAN	Institut Tadbiran Awam Negara / National Institute of Public Administration
JITIK	Government IT and Internet Committee
MAMPU	Malaysian Administrative Modernisation and Management Planning Unit
MDA	Model Driven Architecture
MDeC	Public Service Division and the Multimedia Development Corporation
NAM	National Archives of Malaysia
NARA	The National Archives and Records Administration
NKEA	National Key Economic Areas
NGI	National Gross Income
PMS	Project Monitoring System
RO	Record Officer
RMK8	Rancangan Malaysia ke 8 / Eight Malaysia Plan
RMK9	Rancangan Malaysia ke 9 / Ninth Malaysia Plan
SOP	Standard Operating Procedure
SA	System Admin
TNA	The National Archives of United Kingdom

CHAPTER ONE

INTRODUCTION

This chapter provides a general introduction to a study of email record keeping in the government sector. It presents definitions of the terms used, followed by a statement of the research problem investigated and discusses the research aims, questions, objectives and significance of the study. The chapter concludes with a description of the structure of the thesis.

1.1 Background of the study

Email has become a significant tool for correspondence in both public and private sectors, replacing the traditional method of letter writing. In many organisations, the minutes of meetings and memoranda have disappeared having been replaced by email.

Email is the direct translation of the interoffice, inter-organisational paper-based mail system. According to Ayyadurai (2010, History of Components Necessary for the Invention of the First Email System), “several critical components, beyond the hardware infrastructure, were necessary for the invention of the first email system since 1954 to 1978. These included: the FORTRAN programming language, database technology, robust operating system, and networking protocols”. In 1978, the first email system was created at The University of Medicine and Dentistry of New Jersey in Newark, New Jersey and email systems have continued to develop (Ayyadurai, 2010). However, Peter (2004) stated that the first email system was probably used at Massachusetts Institute of Technology from 1965 and called as ‘mailbox’. The argument about who invented email has continued.

The history of emails started when people who shared the same computer used email to send messages to each other. Email systems became more advanced over the decades. According to Partridge (2008, email systems can be divided into two distinct subsystems that are message handling systems and user agent systems. The former are built on a set of servers called message transfer agents that are responsible for transferring email messages from senders to receivers, whilst user agent systems operate so that they can receive, manage and compose email messages, and then operate with the message handling systems to deliver the messages. The technical aspects of email systems contribute to the email process.

Many of the early issues with email systems, such as limits to the numbers of characters in composing messages, small mailbox sizes, and the lack of standardised messages and headers (Partridge, 2008), have been resolved. For example, the characteristics of email have been developed to fulfil the requirements of users, including the ability to send emails to many recipients and include attachments or links. However, the masses of incoming and outgoing emails, and the resultant multiple threads or part threads, make it difficult to verify the audit trail (Moss, 2012). Faribozzi and Zahidefard (2012) stated that, when an email is sent to a user, there are so many emails that need to be read that it is difficult for an individual to distinguish between emails or to read them thoroughly. Thus, human-related issues remain.

The use of email in business practices and transactions has led to them being considered to be one of the electronic records in the public and private sectors. Therefore, the process of managing email records is important for all organisations. In the government context email messages are classified as records when their content, (including attachments), fulfils the definition of records under public records legislation and/or related government policies; for example, the Federal Records Act (National Archives and Records Administration, 2010) in the USA. In Australia, “emails created or received in business transaction that have value for the Australian Government are determined as Commonwealth records according to the Archives Act 1983” (National Archives of Australia, 2018). Similar concept to United Kingdom (UK), emails are “public records and are subject to the Public Records Act, the Data Protection Act and the Freedom of Information Act” (National Archives of the United Kingdom, n.d). Emails received or sent in governments are public records and subject to the National Archives Act 2003 (Act 629) (National Archives of Malaysia, 2010).

In Malaysia, the government has signed up to the 1Malaysia email project, which will provide a free email account for each Malaysian citizen over 18 years of age to access a single secure communication channel to e-Government services, with a single sign-on user ID (The Star, 2011). This began with the establishment of a Multimedia Super Corridor (MSC) in 1997, in which e-government was one of the seven flagship actions of the MSC initiatives (Kaur, 2006). This has potential implications for the effective management of email and currently, no study has been conducted to fully investigate email management in Malaysia specifically in the context of electronic record keeping in the government sector.

1.2 Definition of Terms

The following definitions of terms related to email and email management represent the perspectives of information technology and records management.

Email

An email is an electronic message transmitted via a computer (Frehner, 2008). As described by Kaviarasi, Anitha, and Suganya (2013), email is a method for disseminating digital messages from one sender to one or more recipients. According to Room (2009) email is a method for creating, dispersing, storing, and accepting messages over electronic correspondence systems. On the other hand, the National Archives of Malaysia (2010) (NAM) defines email as “a system that enables users to compose, transfer, receive and manage electronic messages and images across networks”. In the National Archives and Records Administration’s (NARA) Records Management Key Terms and Acronyms, an email is defined as “a document created or received on an electronic mail system, including brief notes, more formal or substantive narrative documents, and any attachments, such as word-processing and other electronic documents, which may be transmitted with the message” (the National Archives and Records Administration, n.d, p5).

Email System

“An email system is a computer application used to create, receive, and transmit messages and other documents (National Archives and Records Administration, n.d, p2).

Records

ISO15489 (2016) (clause 3.15) defines a record as “information created, received and maintained as evidence and as an asset by an organization or person, in pursuit of legal obligations or in the transaction of business.” The Malaysian Government includes specific examples, ranging from papers, registers, maps, plans, drawings, photographs, microfilms, cinematograph films, sound recordings, or electronically produced records, in their definition (Malaysian Government, 2003).

Electronic Records

According to the National Archives and Records Administration (n.d), an electronic record is a “record stored in a form that only a computer can process. Records can be numeric, graphic, and text information; media can include, but are not limited to, magnetic media, such as tapes and disks, and optical disks.” An electronic record can be defined by identifying and determining its necessary components that can be recognised and captured by a digital information system (Duranti, 2010).

Records Management

ISO15489 (2016) (clause 3.15) defines records management as “the field of management responsible for the efficient and systematic control of the creation, receipt, maintenance, use and disposition of records, including processes for capturing and maintaining evidence of, and information about, business activities and transactions in the form of records”.

Record System

“A record system is an information system used to capture, manage and offer access to records over time. A records system can consist of technical elements such as software, which may be designed specifically for managing records or for some other business purpose, and non-technical elements including policy, procedures, people and other agents, and assigned responsibilities” (ISO15489, 2016) (clause 3.1). A record system is operated according to records management principles, and automated records management systems aid in the capture, classification, and on-going management of records throughout their lifecycle including manual and electronic systems and managing all types of records (Yusof, 2014).

Electronic Record Keeping System

NARA defines an electronic recordkeeping system is “an electronic information system in which records are collected, organized, and categorized to facilitate their preservation, retrieval, use, and disposition” as defined in the Code of Federal Regulations relating to NARA (36 CFR 1234.2) (National Archives and Records Administration, 2000). Such a system is only used to manage records in electronic form.

1.3 Problem Statement

Email has been acknowledged as a formal method for giving and accepting commands, agreements, decisions and other actions. Email is also an information communication system which captures the decisions of organisations. Therefore, every organisation needs to develop and implement an email policy to manage emails as records for evidence and information. However, not all organisations or individuals manage email appropriately and there are examples of poor email management. For instance, Michael Gove, former UK Secretary of State for Education, conducted government business using his wife's personal email account (Vasagar, 2011) and former US Secretary of State Hillary Clinton used a personal email account and server for both government and personal business (Zurcher, 2016). According to The Briefing (2015), Hillary Clinton's email account contained a total of 62,320 sent and received emails from March 2009 to February 2013. The State Department found that approximately half of them related to the Department and the remaining half were private, personal records. One of the reasons Clinton gave for her approach was the use of an email mobile device application that supports flexible working and receipt of immediate responses. Even though the reason may be considered to be positive, the practice contravened government policy which restricts the use of personal email for business purposes and vice versa. However, some commentators contend that Clinton still complied with the relevant laws and regulations (Carroll, 2015).

Another issue which has occurred in government email use can be found in Australia. According to Sveen (2017), thousands of Australian Government officials, including high-profile politicians and senior Department of Defence officials, were among the 1 billion victims of a huge Yahoo data breach where data was stolen from Yahoo in 2013 by a hacker organisation from Eastern Europe. The stolen database contained email addresses, passwords, recovery accounts, and other personal identification data belonging to a wide array of senior Australian officials. This data could enable the identification of officials in the dataset, including their government email details as they were being used as their Yahoo recovery account.

The Australian Government experienced another issue relating to email when Australian citizens received fake emails that claimed to be from the Australian Government and its myGov website (Australian Government, 2017). These emails were part of a phishing scam designed to capture personal and banking information that may then be used for fraud, identity theft and other unwanted and illegal

activities. The public initially believed the email messages but then noticed they were fake, resulting in negative perceptions of the Australian Government.

In summary, email has been accepted as evidence of business processes and needs to be managed in a way that meets legislative requirements. The examples of problems highlight both people and system issues in managing email in organisations. These are two fundamental components for improving email management in the context of record keeping in the government sector. Documented policies and guidelines on managing email exist but practice could be better.

1.4. Research Aim, Questions and Objectives

This study aimed to critically explore the management of email in the context of the transition to digital record keeping in the government sector, focusing on Malaysia.

The research objectives were:

- i. To explore the legal and regulatory environment in relation to the Malaysian Government and the information it creates and holds.
- ii. To explore the evolution of email recordkeeping by the Malaysian Government.
- iii. To critically review existing policies, guidelines and systems for capturing and managing email by the Malaysian Government from a record keeping perspective.
- iv. To investigate the current practices in managing email in a selected part of the Malaysian Government against existing policies and guidelines.

The specific research questions relating to these objectives were:

- i. Why and how does the government sector in Malaysia manage and integrate email records in the overall context of record keeping?
- ii. To what extent are the guidelines effectively aligned with the functional requirements of electronic records management?
- iii. What is the role of the National Archives of Malaysia and MAMPU in providing guidelines for managing email in the government sector in Malaysia?
- iv. What tools and mechanisms are needed for the effective management of emails as records?

1.5 Structure of the Thesis

The thesis contains seven chapters, including this chapter. Chapter Two discusses the literature relevant to the subject under study. Chapter Three discusses and justifies the methodology and data collection and analysis techniques used in the research. Chapter Four presents the Malaysian Government case study, focusing on one selected ministry. Chapter Five presents the research findings and Chapter Six discusses the findings within the context of internationally accepted principles and existing literature. Finally, Chapter Seven presents the conclusions, including the contribution to knowledge made by the study, reflects on the limitations of the research, and makes suggestions for future research.

CHAPTER TWO

LITERATURE REVIEW

This chapter reviews the existing literature and published research on email from a record keeping perspective. It begins with a discussion of email including email as evidence and email management in the government sector, including in three benchmarking countries for the case study of Malaysia, followed by a discussion of the transition to email and the nature of email. This chapter also highlights registry and file classification schemes, electronic record keeping and the ISO 16175 (2012) functional requirements for records in electronic office environments.

2.1 Communication in Organisations and the Transition to Email

Communication is a powerful tool used to express or convey messages. It plays a significant role in the interaction and harmony of individuals both in societal and working life and in collaboration between groups of people and within organisations (Ünsar, 2014). Previously, letters were used as the main form of communication and as a method of gaining feedback in the organisation. However, the use of letters as a communication medium took longer. The organisational procedures used to compose a letter mean that it was usually created by a secretary and needs the signature of the sender or a superior. According to Zhiqiang (2010) the transmission process of the traditional forms of correspondence is complex, the intermediate links are numerous and problems can occur. For example, a letter may be lost or forgotten or others may open private correspondence, and thus these are issues related to both the sender and receiver.

Email is also a communication medium that has been adapted from the letter supported by technological enhancement as a transition in communication (Nelson, 1981 cited in Milne, 2010). According to the National Literacy Secretariat of the Human Resources Development, Canada (1999), a letter has many advantages compared with other forms of communication. For example, a letter is a permanent record of evidence and, compared with other communication methods, people also can have a longer time to compose a letter, proofread it until it is clear and correct it. A letter has a physical form and can be filed in a folder and easily referred to many times if necessary. These advantages can apply to email, as it has similar characteristics. Altman (1982), cited in Milne (2010), stated that an email is like a letter in so far as they are a technology for communication between bodies that are not present in the same place at the same line. One similarity between the letter and

email is in the way metadata is generated. Some email metadata, known as the envelope or header, represents details such as the name of the recipient and sender, email addresses, date, and subject. This is just like a letter where the metadata can be found on the envelope, the header, salutation and content. In some senses email replaces paper mail (Milne, 2010), but email can also be defined as a system that enables users to compose, transfer, receive and manage electronic messages and images across networks and through gateways connecting to other local area networks (National of Archives Malaysia, 2011).

The emergence of the internet has allowed people to communicate more easily and conveniently, thus the use of email allows a message to be transferred quickly and easily (Zhiqiang, 2010). With “the arrival of computers, networks and information and communication technology it became obligatory to develop an electronic mail system, and a revolutionary age for correspondence recordkeeping thus arrived” (Zhang, 2015, p83) resulting from “the unique characteristics of correspondence as a documentary form with its persistent representation features that transcend time, space and media” (Zhang, 2015, p84). Since the mid-1990s, email has become one of the main means for individuals to communicate with each other. According to Ayyadurai (2013), email represents the full-scale electronic emulation of the inter-office, inter-organisational paper-based mail system, a system of interlocked parts by which all offices in the world are run. Kaviarasi, Anitha and Suganya (2013) stated that email is a technique for exchanging digital messages from a sender to one or more recipients. On the other hand, Room (2009) described email as storage and a method of composing, sending, storing, and receiving messages over electronic communication systems. Zhang (2015) provides a very good overview of the development of email.

Email communication became popular because it represents an easy and rapid exchange of information that simplifies communication in organisations with no geographical limitations (Sproull and Kiesler, 1995). Advancement technologies have transformed the use of email as a communication medium within organisations instead of letter. During the last few decades, email communication has been used in most workplaces and has become an essential part of today’s working life (Dabbish and Kraut, 2006). Immediate feedback is one characteristic of email use. Email is a main communication medium in organisations that is used by superiors and subordinates to communicate or request tasks. In a context of request, it was influenced by a language and communicative style to write email messages

(Paramasivam and Subramaniam, 2018). According to Paramasivam and Subramaniam (2018), email functions as “an equalising medium that enabled superiors to be democratic as well as a channel for power enactment that reinforced hierarchical structures”.

Email serves as an official but more compact form of communication and is used as a written communication within organisations to communicate formally via electronic devices (Malaysian Administrative Modernisation and Management Planning Unit (MAMPU), 2014). It can improve “productivity, corporate security or personal privacy and knowledge management” (Parker, 1999, p116). In terms of records management, an email is a record since it is produced and received as part of business activity (Parker, 1999). According to Newcastle University, Australia (2018), email messages have three components, which are the message envelope (addressee, sender, date/time), message body (text of the message) and header information (transmission details such as date and time of sending). The integrity of email records depends on these three components being maintained as a whole. Incomplete messages will fail to act as reliable evidence of the business activities which they document.

2.1.1 Procedures for Composing Letter and Email

In the field of business, a letter is normally a type of correspondence that used for formal communication. A business letter needs to fulfil various criteria, such as being brief, concise, easily understood, and well-mannered using appropriate formal and diplomatic language (National Literacy Secretariat of the Human Resources Development Canada, 1999). The use of letters in any organisation was generally the responsibility of a personal assistant or secretary. According to Ridgeway (1982), the larger the organisation the greater the number of personal secretaries responsible for producing letters. In essence, these are summarised in the phrase ‘one letter, one subject, one reference’. The method of minute-writing would be used in relation to virtually all incoming communications. The normal procedure was that a junior administrative officer would read the item and suggest a course of action. The next process was that senior officers would then contemplate the matter and, in due course, recommendations would be made to the Secretary of State, who would decide upon the action which needed to be taken (Tough and Lihoma, 2012).

Today the responsibility for an organisation’s correspondence is no longer assumed by secretaries. As mentioned by the National Electronic Commerce Coordinating

Council (2004), the secretary's roles in composing and sending letters has virtually disappeared since the implementation of email as a medium of internal and external communication in the organisation. However, the procedure of composing and sending emails is much simpler compared with letters.

There has been some discussion of the acceptance of technology as a means of creating a record with which history will be written. Vincent (2005) cited in Moss (2012) argued that electronic communications such as email are a threat to the writing of history and it means that the history may not exist with the introduction of electronic communication. However, electronic communication is acceptable to the historical studies community because the world is now dominated by information and communication technology. Most transactions and messages are communicated using electronic devices. Of course, email records need to be managed. Even if policies and guidelines have been developed, implementation may still lag behind.

2.1.2 Culture

Correspondence has been art of the Malay culture for centuries. The Malay Manuscript Collection Centre at the National Library of Malaysia, for example, holds a collection of correspondence written in variants of ancient Malay (Wan Mamat, 2005), which can be categorised into different types according to formal and social use.

Letters have been used to symbolically recognise an individual's actions. In Malaysia, a Letter of Credence is used to reward honourable and credible persons in appreciation of their efforts in the country's development. In addition, in Malaysia's rotational monarchy, one of the heads of the nine hereditary states has occupied the throne for five years each since 31st August 1957. A letter of coronation has been used to appoint a new king or 'sultan' (Stockwell, 2008).

The history of the letter in Malaysia is related to Persian handwriting. According to Hamidon (2006), after Islam was introduced in Malaysia, the culture of handwriting was changed with the adoption of Persian handwriting, which was modified to accord with the appropriate speech in the Malay language, and it has been called 'jawi' handwriting. In Malay history 'jawi' handwriting was used for formal and personal reasons and foreigners who want to deal with the sultan have had to learn Jawi or to hire Malay writers to write formal letters on their behalf.

However, when English came to Malaysia, there was a change in the use of handwriting and it became fragmented according to the education system, which uses Malay, English and Arabic. Malay handwriting is similar to English handwriting in using the Roman alphabet. In 1963, the Malaysian Government published the National Language Act 1963 which required the adoption of the Malay language as the national language, and all formal correspondences in the government sector especially, was changed from 'jawi' to the use of the Roman alphabet (Hamidon, 2006). Nevertheless, 'jawi' has continued to be used in correspondence with the Malaysian sultanate, for example in greetings or salutations. Moreover, prescribed criteria, such as using a letterhead, particular font types and sizes and both Gregorian and Islamic dates, need to be followed (Malaysian Government, 2013). The use of letters is partly symbolic, showing the integrity and reliability of the culture.

However, handwriting or letters will never disappear, despite advances in technology since they are used to support social and cultural transformations in combination with the use of technology. Therefore, as long as the technology has been adapted with a particular cultural practices the forms of the handwriting and letter will remain (Neef, Dijck, and Ketelaar, 2006).

2.1.3 Language

The key to correspondence is the clarity of the content of a letter and email. Letters began when handwriting was invented. Neef, Dijck, and Ketelaar (2006) stated that handwriting contributes to cultural practices such as letter writing and other cultural forms and represents an aesthetic category, which uniquely associates calligraphy with urban graffiti, tattooing or signing, where the physical human hand is pivotal in the production of letters and texts. However, there may be readability issues. Neef (2006) explained that working on Anne Frank's diary, some of them were unreadable or difficult to understand because of the handwriting and the language. Difficulties with letters occur when a translator mistranslates a message which is conveyed imprecisely to the reader, especially in cases where the language used is not the translator's native language. Thus, email has advantages because it is composed using an email system that allows users to proofread the language and the structure of the contents by using online checkers or spelling and grammar detectors.

2.1.4 Email and Letter Systems

The term email is a general one covering both email messages and email systems, which are used to compose, transmit, receive and manage email messages across networks and through gateways connecting with the internet (Minnesota Historical Society, 2012). In an email system, the content is integrated with additional files to support the content of the message. The uniqueness of email messages over letters is where an attachment can be in different formats and the links provided can also be external to the email system. Milne (2010) described the processes used in email as being less labour intensive compared with letters which are sent by post and, unlike letters, they usually only involve the creator.

Many email service providers, such as Yahoo!, Hotmail, and Gmail, offer free email accounts, financed out of the proceeds from advertising, and typically provide a browser interface for access. These email accounts not only lead to monetary savings for users in comparison with sending letters, but also help in terms of accessibility since email can be accessed remotely from any device and location. Other advantages of email are additional capabilities, such as tools for instance instant messaging so that users can communicate in the fastest possible way.

Interestingly, Parker (1999) justified that email messages as records but argued that email systems are not record keeping systems. Email systems are communication systems and if users need to keep emails as records, they have to store them in record keeping systems. Encouraging users to use an email record keeping system is challenging. One of the challenges is to communicate with people in organisations so that they accept the record keeping system and comply with the relevant policies and guidelines

However, according to Sir Alex Allan's (2014) report, there have been deficiencies in the management of email systems in the UK public sector. "Material has generally been submitted on paper even where it was clearly digital in origin (print-outs of emails for example), and has often been poorly indexed. The experience has been that departments with strong paper record keeping have generally provided material with the fewest gaps and were more easily able to plug any gaps identified by public inquiries" (Allan, 2014, p18). Such failures in managing email leads to the failure of records management.

2.1.4.1 Metadata of Email

The latest statistics published by the Radicati Group (2018) show that the number of emails sent and received per day in 2018 will reach 281 billion, and by the end of 2022 the figure will be 333.2 billion. One of the benefits of email is that a history or trail of messages between a sender and recipient can be verified. Good metadata helps users to retrieve precise and accurate records of transactions. The accuracy of email metadata increases the chances of retrieving the relevant accurate information.

Challenges in manual and automatic captured of email metadata rely upon electronic record keeping system designs and users. However, email metadata is usually taken from the header, which consists of the sender's and recipient's email addresses, the date and subject line. According to Yang and Park (2002), the metadata provides additional information to enhance classification capability by showing a categorization based on the header.

Furthermore, the information held in email metadata can be divided into three categories relating to users, applications and file or storage systems. Email attachments provide links to websites, and data held in cloud storage or on other devices. Thus, the choice appropriate metadata is important to identify the attachments from varied sources. In handling the email, developers and users need to consider the appropriate metadata such as owner and timestamp of the file system, the file extension and the retention policy for each file or bit of information.

Email records can be accessed and retrieved using search tools, but with appropriate metadata levels of efficiency and effectively can be increased. In summary, email is a communication medium between people that use electronic devices.

2.2 Registries and File Classification

2.2.1 The Nature and Function of Registries and Registry Filing Systems

The term registry means a “records office that is responsible for the receipt, control and maintenance of current records” (International Records Management Trust, 1999). A registry can be defined as “a division within an organization responsible for the recording, control, and maintenance of records” (Society of American Archivists, n.d). The main function of a registry is to store an organisation’s records and control the content, context and structure of the records for subsequent use. The term registry can also refer to a site to place the documents, like a file room (Stephens, 1995).

A registry is a system used to capture and link the context of records with their content. It is a system for controlling the context of records and retrieving its content (Hurley, 1994) and how the organisation captured their records in a system to address a broader range of record keeping needs. The main function of registries is well described by Craig (2002) whereby agreed procedures to control records are achieved using processes for the management of their use, location, ordering, and content. Furthermore, the registry is a system that links the content, context and structure of records. It improves the record keeping process in an organisation. An example in a particular country, where one of the most important people responsible for the shift from handling individual papers as separate units towards the aggregation of papers in files is Sir Frederick Napier Broome (1842–96). “In 1892, Broome issued regulations for official correspondence and business as the Governor of Trinidad. The regulations required heads of department to use a ‘jacket’ system when conversing with the Colonial Secretary” (Tough and Lihoma, 2012, p196).

The main characteristic of the registry filing system is the method used to capture and list the receipt and movement of records which are in active use in the organisation. Registry methods can involve books, cards and also electronic systems. Records stored in a registry have previously been paper based records managed according to the concept of the life cycle.

In England a formal registry filing system for government documents first appeared in the 13th century using the classification of incoming and outgoing correspondence (Stephens, 1995). During that time, a decentralised registry was implemented on a

divisional basis with departmental registries in every department of the civil service in the United Kingdom (Craig, 2002). However by 1920 this had been restructured into centralised registries. Many trial and error practices have been adopted by the British in designing the registry filing system.

There are two main types of the registry: centralised and decentralised registries. The centralised registry is a registry for all divisions and the decentralised registry is based in every department of the civil service in the United Kingdom (Craig, 2002). A registry should be managed by specific staff in an organisation as records in the registry are the property of the organisation. Information in the registry needs to be confidential.

According to Tough and Lihoma (2012), a confidential registry was provided for in Governor Broome's regulations. Meanwhile in the Western Australian regulations of 1883, it is stated that:

“Communications marked ‘confidential’ should be kept separate, and under lock and key. They should not be entered in the general register of the office, but a confidential register should be kept by the head of the department, who can access, and by whom the envelopes should be opened and the replies written” (Tough and Lihoma, 2012, p198).

According to Raas (1999), in a decentralised electronic record keeping system where officers register their own documents, a records manager needs some way of standardising data input. A record plan allows the setting up of a hierarchical classification system that can be used for record titling and numbering. Based on the classification selected, the system can automatically apply default values of security, home location, owner location and matching the records. However, there is an important issue related to confidential registries. During the implementation, the size and complexity of a confidential registry may increase and serious operational problems can arise. Since only selected persons are allowed to access the registry and deal with the records, that person has to deal with all areas of business. Moreover, if there is no clear functional analysis or business classification scheme. Thus, a classification scheme is crucial to the registry since it helps the record keeper to control the structure and contents of records.

Centralised and decentralised registries each have advantages and disadvantages. According to Craig (2002), the advantage of a centralised system is there is intellectual control over the records created because of the same standard and centralised policies used, mail operations, classification schemes, procedural

practices, and the retention and disposal schedules. Moreover, the security of a centralised registry is easy to maintain because the records are stored in the same location. However, the advantages of the decentralised registry include rapid retrieval processes due to split locations and smaller numbers of records. Nevertheless, the use of centralised registries involves obstacles in communication between central registry staff and divisional staff (Craig, 2002). The latter prefer to have their own clerks to handle records since they have a better understanding of the subject and the flow of the records in the division.

In the British government, some departments run centralised registries; others have decentralised registries according to divisions or branches (Stephens, 1995). The practice in Malaysia, which was a British colony, is similar. The Malaysian government currently has a centralised registry in each ministry. However, this centralised registry focuses on open access records. Other decentralised registries, which are named file rooms, have been implemented in the Ministry departments or divisions to manage classified records, such as those that are named confidential, secret or top secret records. According to Tough and Lahoma (2012), a four-tier scheme of security classification can be adopted: top secret, secret, confidential and restricted. This scheme has been adopted by the Malaysian Government for their classified records.

This practice contrasts with, for example, German practice. In Germany, a decentralised registry system operates, with one registry for each division in a government ministry, but it contains all records, irrespective of access limits. Records are classified according to a standard registry (subject matter) classification scheme (Stephens, 1995). According to Tough and Lihoma (2012), the Dutch empire provided a prime example of centralised control over record keeping systems. Record keeping was known to be important “from the beginning of the Charter of 1602 granted to the Vereenigde Oost-Indische Compagnie (VOC or Dutch East India Co)” (Tough and Lihoma, 2012, p192). In fact record keeping requirements of were included in staff employment contracts from 1616 and, starting from 1643, the content of the main record series (daily registers) were captured in detail.

A filing system can either help users in retrieving records or make it more chaotic for them. As mentioned by Parker (1999, p22), most complaints about filing systems are that the system is too complicated to use and users cannot find records: “up to 10% of staff time is used to look for the records and 85% of documents which are filed are

never retrieved.” The functions of registry filing systems are to index and control the records before any processing of them takes place in the organisation (Stephens, 1995), including tracing the movement of records. Moreover, registry filing systems create and capture records as evidence of business transactions and provide links between records during the retrieval process (Packalen and Henttonen, 2015). They help to establish an original order and to return documents to their exact location (Lindh, 1993). Besides making the records available for business transactions and as evidence, a major function of registry filing systems is to maintain the organisational memory that has a high value.

A registry filing system is dependent on both the system used and the individual who is responsible for it. The nature of the relationship between the context and the content of the records is crucial for an effective registry.

2.2.2 Registry Classification Schemes

A registry system includes a file plan that assists a public servant in retrieving records accurately and efficiently. The National Archives and Records Administration (n.d, p6) has defined the file plan as “a plan designating the physical locations of an agency’s files which are to be maintained, the specific types of files to be maintained there, and the organisational elements having custodial responsibility for them. A document is defined as consisting of the identifying (reference) number, title or description, and dispositional authority of the files held in an office”. The term file plan together with a filing system is identified as “a set of policies and procedures for organizing and identifying files or documents to speed their retrieval, use, and disposition” (National Archives and Records Administration, n.d, p6). Sometimes this is called a record keeping system. File plans are used to manage both paper and digital files in organisations, which helps to improve efficiency in the retrieval process.

According to The National Archives of United Kingdom (n.d), the file plan for both paper and digital files should reflect the activities of the organisation through a planned and managed series of folders. This will allow staff to file and retrieve information efficiently and access to information to be controlled. “A file plan should be easy to understand by the user and classify the information according to the activities of the organisation applicable to all records, including both paper and electronic records” (National Archives of United Kingdom, (n.d, Filing structures). When there is a transition of records from paper based to electronic records, a file plan is essential to cross reference between both types of record. “A file plan should

also preserve context within the records created, allow associated metadata to be captured and managed, and finally provide appropriate levels of access to sensitive information to organisation staff and security” (National Archives of United Kingdom, n.d, Filing structures). The National Archives and Records Administration (2010) have simplified file plans as a tool to specify how records are to be organised once they have been created or received, and provide a “roadmap” to the records created and maintained by an organisational unit, and enable the records disposal.

In Britain, initially the classification and indexing of the records was completed when the papers were filed away at the conclusion of business. In 1946, the British government decided to create a division of records into unofficial, semi-official and official, which has been used until now in records management fields throughout the world (Craig, 2002). The registry filing system in Britain were improved by the 20th century when the system was designed to solve the problems of office work instead of just to be storage for records (Craig, 2002). After restructuring, the government decided to identify the subject of records upon receipt at the registry. Moreover, the process of sorting records changed from focusing on the physical object to subject classification (Craig, 2002).

Similar practice in one of the example country, in Iceland a registry started in the late 18th century where all incoming letters sent to a government agency were registered with two registry systems: ‘rentukammerkerfi’ and ‘kansellikeffi’ (Gunnlaugsdottir, 1999). ‘Rentukammerkerfi’ is the process of registering an incoming letter without considering the content and ‘kansellikeffi’ is the process of registering a letter according to the subject or sender. However, these systems were supplanted by a numeric-subject system (based on the letter subject) and a numeric system (based on division, group, and sub-group) (Gunnlaugsdottir, 1999).

In Germany, a file classification scheme using a four-level and digit hierarchical system has been used. The files have been classified according to hierarchy. The primary subject is located at the top of the hierarchy, followed by the main functions or activities of an organization, the categories and finally individual files units (Stephens, 1995).

According to Tough and Lihoma (2012), in the early stages of the Malayan Emergency in the late 1940s, there was hardly any record keeping system for the police Special Branch in Singapore or Kuala Lumpur. Just like in other British post-

colonial countries, many records of the police Special Branch were destroyed, and some files, which were deemed to be sensitive, were moved to the UK.

2.2.3 File classification scheme

Fundamental principles of managing and organising records in organisations, such as classification and filing, have received less attention from records management professionals, having been abandoned by newer and more demanding topics like web archiving and digital preservation (Mata, 2017). Yet, the classification of records is essential for organisations to ensure the availability of records and to manage them accordingly. File classification scheme is “a system that describes standard categories and that is used to organise records with common characteristics” (United Nations Archives, 2016, p11). The process of records classification helps the organisation to describe, organise and control its records for future use. It creates understanding on what an organisation does and how it does it. Records classification is undertaken for the purpose of managing records to their business context within an organisation. Therefore, the organisation needs to understand its business functions in order to design a good classification system. ISO 16175:2 (2011, p6), defines classification as “the systematic identification and arrangement of business activities and/or records into categories according to logically structured conventions, approaches, and practical rules represented in a classification system”. The processes of indexing and classifying the records are fundamental and involve vocabulary control, which ensures records can be accessed and retrieved efficiently. According to Henttonen (2012), classification schemes in records and archive management were the main tool for registries to provide information about the records held.

The challenge of classification schemes is that they are subjective. The people who devise them think that they are logical and easy to follow; however, the people who use the classification scheme often see it differently (Parker, 1999). There are three key things that need to be considered in developing the classification schemes: “structure, terminology and classification codes” (Parker, 1999, p25). Developing a file classification scheme is a process of identifying categories of business activities, the records generated in the organisation and the grouping of records into similar subjects, if applicable, into files to facilitate retrieval, description, and control, and to determine and link their disposition and access status (United Nations Archives and Records Section, 2012). Scholars have discussed the elements to be considered in the classification of records that are identified through their functions, activities,

processes and transactions. These elements define the structure of a records classification scheme, the top of the hierarchy being functions and activities which determine the structure of classes; with the actions and transactions determining the series in which file units are created and records are filed. This has been applied in many organisations including the Malaysian Government. The most common types of registry system normally use numerical, alphanumerical and alphabetical ordering to organise records. An alphanumerical ordering has been adopted by NAM in designing the classification schemes to be used by the public sector in Malaysia. The development of file classification scheme in the Malaysian Government will be discussed in Chapter 4. Besides the challenges in designing and determining the hierarchy of classification, a good file classification scheme is able to classify records in unstructured environments, for instance electronic and web documents, emails, and hard copy records (Ministry of Agriculture and Fisheries, 2010). Business processes and classification system concerns the file management plan or taxonomy should be linked together to control record keeping in the organisation (Duranti, Suderman and Todd, 2008).

2.2.4 Challenges of Registry Systems

The advantage of a registry filing system is that records are classified early during capture and before they are sent to recipients. However, Morddel (1989) stated that even though the British government and its colonies and ex-colonies had implemented dozens of registries, none of them fully worked and was able to cope with the number of paper files involved. In contrast, registries have recently changed from being traditional forms with paper based records to electronic registries and records. According to Packalen and Henttonen (2015) a paper-based registry may be disorganised and poorly equipped with insufficient manpower. Consequently, files cannot be retrieved, and information is unavailable. All organisations, and particularly large ones such as governments, are liable to duplicate effort and make poor decisions. Other challenges are to ensure that the correct metadata is used for different formats of records and training for those responsible for handling the registry systems. According to Tough (2003), with the electronic registry systems and the use of software, the staff that handle filing need to be trained. System implementation can be success if users are well trained. The users should be trained in order to understand the system and to be able to comply with the procedures required (Parker, 1999).

All the major problems identified above are used as evidence to improve the registry and transform into a better. The archives and records institution, the government and the departments take responsibility for completing the process.

2.3 Problems in Managing Email

Given that email is now the main correspondence tool for communication within any organisation, between businesses and with members of the public, for any organisation a failure to manage emails implies a failure in records management generally (National Archives of United Kingdom, 2012). In the context of record keeping there is a need for users to recognise emails as records that need to be captured and managed just like all other types or formats of records, because emails can be used as evidence of a transaction. The large numbers of emails sent and received affects the process of email response. Security issues, such as email hacking is another reasons why email needs to be managed.

However, current email management practice needs to be improved (Pignita, Lushington, Sloan and Buchanan, 2015). According to McMurtry (2014) there are three approaches to email management: employee strategies, the employer's strategies and email inbox improvement strategies. These three strategies are essential to ensure that the management of email in the context of records management can be achieved. The approach to the implementation of email management needs to be documented in guidelines and policies. Records management and information technology expertise is needed to design email policies and guidelines in the context of record keeping. The requirements of the email policies and guidelines need to be considered for every aspect of the organisation (Bailey, 2012). Gupta, Sharda and Greave (2010) stated that email response policy and guidelines needs to implement in the organisation and both of records management and information technology expertises need to merge their skills. Email management is not just a documentation, but it also needed as information of a task in the organisation (Bailey, 2012).

Four tactics concern as policy, design, implementation and standards are available to records professionals to ensure that an email record is created and preserved in such a way that meets the functional requirements for record-keeping (Bearman, n.d) cited in Bailey (2012). Email management also involves training staff to handle activities related to email (Pignita, Lushington, Sloan and Buchanan, 2015)

2.3.1 Email Management by the UK, Australian and USA Governments

Generally, records management policies in countries such as Australia, the USA, and the UK are based on acts, statutes, laws, and specific standards. There are some statutes, rules and laws relating to the creation and retention of records in Malaysia. Nevertheless, compared to the countries mentioned above, Malaysia is still considered to be average in terms of laws for records (Yusof, 2009). These developed countries are considered as national benchmarking countries for Malaysia in the context of records and archives management (personal communication, 2016). Thus, email management in these countries is reviewed in seeking best practice for the Malaysian Government. Tables 1, 2 and 3, identify the lists of acts, policies, circular, guidelines or any government documents related to email management in the government sectors in Australia, the UK and the USA.

2.3.1.1 United Kingdom

In the United Kingdom emails are important types of records for all organisations. They are public records if created or received in the public sector and are subject to the *Public Records Act* (Great Britain, (1958), *the Data Protection Act* (Great Britain, (2018) and *the Freedom of Information Act* (Great Britain, 2000). Therefore emails need to be managed in such a way that meets legislative requirements (National Archives of the United Kingdom, n.d). Table 1 shows policies, principles and guidelines for email management in the United Kingdom. The main guidance provided by the National Archives of the United Kingdom (TNA) is set out in the *Guidelines on Developing a Policy for Managing Email* (National Archives of the United Kingdom, 2004) issued by the National Archives of United Kingdom. The National Archives of the United Kingdom (2015) has also published *Guidance Principles on the Auto-deletion of Email*. These publications state which emails can be deleted and what technologies can be put in place to assist organisations, and they form part of TNA's existing set of guidelines on managing emails.

This *Guidance Principles on the Auto-deletion of Email* (National Archives of the United Kingdom, 2015) aims to help make the management of mailboxes easier. Two auto-delete policies are set up for individual mailboxes: the deletion of calendar items after two years and of sent items after one year. However, this policy is not valid for Executive Directors and team mailboxes (National Archives of United Kingdom, 2015), but no justification is given in the guidelines for this limitation. This approach is similar to NARA's Capstone approach where it determined final disposition "by the

role or position of the account user, rather than the content of each individual email” (National Archives and Records Administration, 2015, p7). The UK government also provides guidance on securing government emails in a government website, which places the emphasis on any individuals who manage government IT systems (Government of United Kingdom, 2016.) Based on such guidance, the UK government has stated that public sector organisations need to maintain documentation and end user policies for managing emails. As email administrators, IT specialists have to decide the technology used for managing email, the need for securing email government and the policies and guidelines concerning the implementation of email management in the organisation (Government of United Kingdom, 2016). Any policy for email management should be reflected in the organisation’s existing information management policy, ensuring that it is aligned with the organisation’s business requirements for information management.

Users often store and share email records in shared drives as a back-up (National Archives of United Kingdom, 2016). One of the challenges in managing email is capturing them in information management systems or shared drives (Seles, 2017). Records in shared drives tend to have no record keeping controls since they are not record keeping systems. Seles (2017) identified two practices in relation to email management using information management systems in the UK government. People preferred to ‘drag and drop’ emails into the information management system, which contributed to high volumes of emails in the system and represented 60-70% of all of system’s content. This created an issue related to Personal Storage Table (PST) files since it filled up the storage space in Microsoft Office. It was concluded that emails are problematic but it may give benefits to users if they understand the context and structure of email.

Document	Author	Publication Date	Purpose / Function
Public Records Act 1958 (amended 1967)	UK Government	July 23 rd , 1958	An Act of the Parliament of the United Kingdom forming the main legislation governing public records in the United Kingdom (Great Britain, 1958).
Freedom of Information Act 2000	UK Government	November 30 th , 2000	"Regulates the disclosure of information held by public authorities or by persons providing services for them, and to amend the Data Protection Act 1998 and the Public Records Act 1958; and for related purposes"(Great Britain, 2000).
Guidelines on Developing Policy for Managing Email	The National Archives	2004	"Provides advice on aspects and areas that should be considered when developing an organisational policy for managing email. The guidance addresses how email can be used as a business tool for internal and external communication and how email communications should be managed as records. Although there is some advice about where email records should be managed, the guidance does not provide detailed technical advice on the management of email records"(National Archives of United Kingdom, 2004)
Business requirements for managing digital information and records	The National Archives	2013	"Describes eight common outcomes that, if delivered, will ensure the value of digital information and that the benefits of managing it, are realised. Business requirements describe at the highest level what the business should achieve and why. The ways in which they are met through applications and processes, and the how concerns detailed within functional or operational specifications" (National Archives of United Kingdom, 2013).
Guidance principles on the auto-deletion of email	The National Archives	October 2016	"This document sets out the guiding principles for the auto-deletion of email. It sets out what emails can be deleted and what technologies can be put in place to assist departments. It forms part of the National Archives' existing suite of guidance on managing emails" (National Archives of United Kingdom, 2016).

Table 1: Policies, Principles and Guidelines Relevant for Email Management in the United Kingdom.

2.3.1.2 Australia

In Australia, email must manage according to the Archives Act 1983 (Australian Archives. (1983). Table 2 shows policies, principles and guidelines relevant for email management in Australia. In 2008, the Department of Finance and Deregulations of the Australian Government published guidelines entitled *Australian Government Email Address Naming Standards and Implementation Guidance* (Australian Government, 2008). The purpose of this document was to detail the Australian Government's email address naming standards and to provide guidance to assist agencies in implementing these standards. The National Archives of Australia emphasise the importance of having clear business rules, policy and procedures to guide staff to use emails in the context of record keeping (National Archives of Australia, 2018). A continuing programme of communication and training is necessary to remind people of their roles and procedures according to the policies and guidance.

Under the Australian Government *Digital Transition Policy* (National Archives of Australia, 2011) any digital information including emails needs to be managed in a digital format, not in printed physical files. Emails should be stored in a system, for instance an EDRMS (Electronic Document and Records Management System) or any other suitable system. The practice in the Australian Government is that emails need to be stored in a network or shared drive system if the organisation is not already using any such suitable system to store email records, rather than the email system, based on records management principles. However, information in shared drives can be altered or deleted without authorisation, and so this should only be a temporary solution. Despite the National Archives of Australia's email management initiative a trust issue with emails still exists and because of that lacked of trust issue of using email to provide sensitive personal data, the Government has decided to implement a digital mail service in 2013. This digital mail service or named as myGov digital mail service is "to provide individuals with secure online access to a range of Australian Government services in one place" (Australian National Audit Office, 2017, Background). The government's aim is to transform how it conducted online transactions, expanding and improving the myGov digital mail service is an important part of this process.

Document	Author	Publication Date	Purpose / Function
Archives Act 1983	Australian Archives	1983 (amended July 1 st 2013)	"The objective of this Act are to identify the archival resources of the Commonwealth; preserving and making publicly available the archival resources of the Commonwealth; overseeing Commonwealth record keeping by determining standards and providing advice to Commonwealth institutions; and imposing record keeping obligations in respect of Commonwealth records " (Australian Archives, 1983).
AS ISO 15489	Standards Australia	2002	"The Australian and international standard for records management, AS ISO 15489, provides guidance on creating records policies, procedures, systems and processes to support the management of records in all formats and provides the basis for all the National Archives' records management standards, policies and guidelines. It is widely used in Australia and internationally in both private and public organisations" (Standards Australia, 2002).
Email Address Naming Standards and Implementation Guidance	Australian Government, Department of Finance and Deregulations	February 2008	"To detail the Australian Government Email Address Naming Standards and to provide guidance to assist agencies in implementing these standards" Australian Government. (2008).
Digital Transition Policy	National Archives	July 2011	"The purpose of the Digital Transition Policy is to move Australian Government agencies to digital information and records management for efficiency purposes" (National Archives of Australia, 2011).
AGLS Metadata Standard: Australian Government Implementation Manual	National Archives	August 2011 Version 3.0	"This manual is intended for Australian Government staff responsible for policy and practice on the provision of web-based information and services, and for ICT staff responsible for technical implementation. It provides advice on determining metadata requirements for different kinds of business systems, and deciding which metadata authoring tools to use and coverage of specific implementation issues, including storage and accessibility and maintenance" (National Archives of Australia, 2011).
Email Protective Marking Standard Implementation Guide for the Australian Government	Australian Government: Information Management Office	May 2012 Version 2012.2	These guidelines supersede Versions 2011 and 2012.1. Copies of the previous guidelines could not be found. However, there is a statement regarding the changes made to the previous version. The major change is that, in previous versions of the standard, protective marking always contained a security classification. "In this version of the standard, the protective marking must contain either a security classification, or a dissemination-limiting marker, or both" (Australian Government, 2012).

Email Protective Marking Standard for the Australian Government	Australian Government: Information Management Office	August 2012 Version 2012.3	“This Standard defines the format of protective markings for Internet email message headers used for messages exchanged within and between Australian Government agencies. A protective marking conveys the protection requirements for information in a message, as defined within the Australian Government Protective Security Policy Framework. The protective marking may also contain additional information about the message that tells system users how to appropriately disseminate the information contained in the message” (Australian Government, 2012).
Email Protective Marking Standard Implementation Guide for the Australian Government	Australian Government : Information Management Office	August 2012 Version 2012.4	“This document provides guidance for agencies on the implementation of new protective markings, including dissemination limiting markers for email. It is important that the implementation of the new protective markings is completed in a coordinated and consistent manner across government. This Implementation Guide should be read in conjunction with the PSPF, the ISM and the Email Protective Marking Standard for the Australian Government (v2012.2)” (Australian Government, 2012).
Digital Continuity 2020 Policy	National Archives	October 2015	“The policy promotes a consistent approach to information governance across the Australian Government and within individual agencies. It applies to government information, data and records, as well as systems, services and processes, including those created or delivered by third parties on behalf of Australian Government agencies” (National Archives of Australia, 2015).
Information Management Standard	National Archives	2017	“The Information Management Standard assists Australian Government agencies in creating and managing business information effectively by outlining the principles for well-managed information within the Australian Government jurisdiction, and the National Archives of Australia’s expectations for the management of business information to enable agencies to meet business, government and community needs and expectations” (National Archives of Australia, 2017).

Table 2: Policies, Principles and Guidelines Relevant for Email Management in Australia.

2.3.1.3 United States of America

“Federal agencies are required to manage their email records in accordance with the Federal Records Act and 36 CFR Chapter XII Sub-chapter B” (National Archives and Records Administration, 2010, Email Management) .The United States of America (USA) government published Bulletin 2014-06 (National Archives and Records Administration, 2014) on the NARA website on the subject of managing emails about the requirement to manage emails electronically and was published on December 31, 2016. NARA efforts in managing email records in the public sector have resulted in various documentation on the subject, such as the *Criteria for Managing Email Records in Compliance with the Managing Government Records Directive (M-12-18)* (National Archives and Records Administration, 2018). Table 3 shows policies, principles and guidelines relevant for email management in the USA.

Based on the National Archives and Records Administration (2018) report “*Criteria for Successfully Managing Permanent Electronic Records*”, the applicable universal ERM requirement allows access to permanent electronic records wherever they reside. This includes access to records stored on personal hard drives, personal network drives, personal email storage table (.pst) files, and individual cloud storage spaces. This also includes access to records in public, private or community cloud environments.

Previously, email has been captured by adopting the “print-and-file” method and is still relevant to selected organisations that are still using paper and hybrid record keeping systems. However, these hybrid record keeping systems have encouraged the National Archives and Records Administration (NARA) to develop an approach for managing email known as ‘Capstone’ (National Archives and Records Administration, 2015). Print to paper is untenable in the context of the volume of emails being created and two risks ensued: “1) a risk that permanently valuable email is not being appropriately captured and transferred to NARA, and 2) a risk that temporary email is being destroyed too soon or kept far too long” (National Archives and Records Administration, 2015, p5). Further, “NARA has not received significance amounts of electronically-managed email through traditional

records scheduling policies or traditional records management practices” (National Archives and Records Administration, 2015, p6-7).

The basis of the Capstone approach is “the categorization and scheduling of email based on the work and/or position of the email account owner” (National Archives and Records Administration, 2015, p3). This allows a systematic approach for disposing of email and reduces the email-by-email review by individual end-users within agencies. Email that is designated as permanent is transferred to the legal custody of the National Archives, and email that is designated as temporary is eligible for eventual destruction (National Archives and Records Administration, 2015). This highlights the strength of this approach. It can easily be automated. However, a challenge of this approach is identifying the users and their positions. A lot of organisational business occurs at levels or positions that may not be the most seniors.

Another significant piece of work, which has been on-going since 2016 and is about to report, is addressing the issue of preserving email records over time, looking at technical approaches to doing this port. The draft report identifies a sense of the recommendations that will be made (Task Force on Technical Approaches to Email Archives, 2018). These focus on two complementary areas that are Community Development and Advocacy, and Tool Support, Testing, and Development. The recommendations are categorised into low barrier, or short term activities, and high impact, or long term activities.

In relation to Community Development and Advocacy it is suggested that the archives need to increase their knowledge, information sharing and collaboration among stakeholders in preserving email. “The archival community needs awareness and training for archiving email” (Task Force on Technical Approaches to Email Archives, 2018, p8). The area focuses on the importance of information culture in the community. The suggestions for short term activities are to: assess institutional readiness for email collections; training and skills development; demystify email archiving for collection donors; maintain assessment of email tools in COPTR (the Community Owned digital Preservation Tool Registry); and develop a format comparison matrix for email formats. The suggestions for long term activities

are to: sustain the email archiving community; adopt specification planning for beginning-of-lifecycle email tools; develop criteria for email authenticity; improve the standards documentation for the MBOX and EML file formats; and improve options for PDF in email archiving workflows.

In Tool Support, Testing, and Development, “the recommendations are directed to the software development community as well as funders” (Task Force on Technical Approaches to Email Archives, 2018, p14). The suggestions for short term activities are to: test existing tools for data impact and data loss; and improve format identification, characterization, and validation tools for email formats. The suggestions for long term activities focus on sustaining and integrating existing tools; developing a self-archiving tool; developing standards for tool interoperability; and improving tools for sensitivity review.

The Department of Homeland Security in the USA issued a binding operational directive (BOD 18-01) in October 2017, demanding that all federal agencies implement several key measures to improve the security of their emails and websites (García-Tobar, 2018). The BOD 18-01 (United States Government, Department of Homeland Security, 2017) requires agencies to implement email authentication through a set of standards (especially Domain-based Message Authentication, Reporting and Conformance, or DMARC) that support email servers and email clients in the validation of the authenticity of emails received by recipients. Email authentication means that emails received can be trusted come from the organisation whose domain name appears in the ‘From’ field. This can be seen as a certified, validated return address. The USA government has instructed its organisations to increase email security levels since there is lack of email authentication by federal agencies. The aim of DMARC is to protect the government domain from misuse and to avoid being hacked by unauthorised people. However, to enforcing the implementation of DMARC and setting it as a policy is a challenge for the USA Government (García-Tobar, 2018).

Document	Author	Publication Date	Purpose / Function
Endorsement of DoD Electronic Records Management Software Applications Design Criteria Standard, version 3	National Archives and Records Administration	September 10 th , 2008	"This bulletin advises agencies that the National Archives and Records Administration (NARA) endorses version 3 of the Department of Defense (DoD) Electronic Records Management Software Application (RMA) Design Criteria Standard (DoD 5015.2-STD, April 2007) for use by all Federal agencies" (National Archives and Records Administration, 2008).
United States Government Policy and Supporting Positions (Plum Book), 2008	Committee on Homeland Security and Governmental Affairs United States Government	November 12 th , 2008	"This publication contains data (as of September 1, 2008) on over 7,000 federal civil service leadership and support positions in the legislative and executive branches of the Federal Government that may be subject to non-competitive appointments (e.g., positions such as agency heads and their immediate subordinates, policy executives and advisors, and aides who report to these officials). The duties of many such positions may involve advocacy of Administration policies and programs and the incumbents usually have a close and confidential working relationship with the agency head or other key officials" (United States Government, 2008).
Pre-Accessioning: A Strategy for Preserving Permanent Electronic Records	National Archives and Records Administration	2009	"This gives guidance in terms of pre-accessioning. It mentions the process by which agencies transfer to NARA a copy of permanently valuable electronic records while retaining legal custody and control over access to the records" (National Archives and Records Administration, 2009).
Information Security : Federal Guidance Needed to Address Control Issues with Implementing Cloud Computing	United States Government Accountability Office	May 2010	"Federal laws and guidance specify requirements for protecting federal systems and data which would include cloud computing such as email. Recognizing the importance of securing federal systems and data, Congress enacted the Federal Information Security Management Act of 2002 (FISMA) to strengthen the security of federal information and information systems within federal agencies" (United States Government, 2010).
Guidance on Managing Records in Cloud Computing Environments	National Archives and Records Administration	September 08 th , 2010	"This bulletin addresses records management considerations in cloud computing environments and is a formal articulation of NARA's view of agencies' records management responsibilities. As agencies are increasingly evaluating, piloting, and adopting these technologies, they must comply with all Federal records management laws, regulations, and policies" (National Archives and Records Administration, 2010).
Electronic Code of Federal Regulations: E-CFR Part 1236—Electronic Records Management	Office of the Federal Register	No date (updated February June 8 th , 2018)	"The statutory authority for this part is 44 U.S.C. 2904, 3101, 3102, and 3105. OMB Circular A-130, Management of Federal Information Resources, which applies to records and information systems containing records" (United States Government, n.d).
M-12-18 Memorandum for the Heads of Executive Departments and Agencies and Independent Agencies	Office of Management and Budget	August 24 th , 2012	"The function of this memorandum is to reform records management policies and practices and to develop a 21st-century framework for the management of government records" (United States Government, 2012).

Guidance on a New Approach to Managing Email Records	National Archives and Records Administration	August 29 th , 2013	"Provides agencies with a new records management approach, known as "Capstone", to be used their Federal record emails electronically. It discusses the considerations that agencies should review if they choose to implement the Capstone approach to manage their email records" (National Archives and Records Administration, 2013).
User Guide: Managing Nara Email Records with Gmail and The ZI Unified Archive	National Archives and Records Administration	Version 1.0 September, 2013	"Provides a management framework to ensure compliance by automatically categorizing and managing NARA's internal emails each day according to the appropriate policies (National Archives and Records Administration, 2013).
Automated Electronic Records Management Plan	National Archives and Records Administration	September 19 th , 2014	"The plan contains a framework of three areas for governance, procurement, and technology and listed several items under each area in automated electronic records (National Archives and Records Administration, 2014).
15-01: Fiscal Year 2014-2015 Guidance on Improving Federal Information Security and Privacy Management Practices	Office of Management and Budget	October 3, 2014	"To provide an enhanced understanding of the Department or Agencies' cyber posture, and to promote a secure and resilient IT infrastructure" (United States Government, 2014).
White Paper on the Capstone Approach and Capstone GRS	National Archives and Records Administration	April 2015	"This white paper helps explain the process and decisions leading to the development of a General Records Schedule (GRS) for Email Managed under a Capstone Approach, as well as providing additional contextual information and detail not included in the typical appraisal report" (National Archives and Records Administration, 2015).
NARA 2015-04: Appendix A, Minimum Metadata Elements and Terms	National Archives and Records Administration	Updated: September 14 th , 2015	"This provides the minimum list of metadata terms necessary for describing permanent electronic records. These terms have been adapted from the Dublin Core Metadata Initiative (DCMI) to support the federal records management of permanent electronic records" (National Archives and Records Administration, 2015).
Toolkit for Managing Electronic Records	National Archives and Records Administration	May 6, 2016	"This spread sheet provides descriptions of a collection of guidance products for managing electronic records. It includes resources ("tools") that have been developed by NARA and other organizations" (National Archives and Records Administration, 2016).
Criteria for Successfully Managing Permanent Electronic Records	National Archives and Records Administration	March 16 th , 2018	"This document provides agencies with guidance for successfully managing permanent electronic records in compliance with the 2019 targets" (National Archives and Records Administration, 2014).

Table 3: Policies, Principles and Guidelines Relevant for Email Management in the USA.

2.3.2 Email as Evidence

In order to count as records, emails need to be accepted as evidence of transactions. Some legal firms state that an email can be admitted as evidence in court. "Email is a form of documentary evidence and can be admitted as evidence in court in the same way as can other forms of documentary evidence" (Pinsent Masons, n.d, Admissibility and reliability).

Emails have been used as evidence in court. For example:

"In *Kasten v. Doral Dental USA, LLC*, 2007 Wisc. LEXIS 405 (Wis. June 22, 2007), the Wisconsin Supreme Court reversed and rejected the findings of the trial court's conclusion that email was a communication rather than a document. They concluded that the term [company documents] in the company's operating agreement in fact had a broader meaning than [records] and included drafts and emails that were not private communications" (Koopmann, 2009).

"In *Armstrong*, the U.S. Court of Appeals held that the electronic version of a paper record is itself a record, not just an extra copy of the paper version of the record, and can only be disposed of with the approval of the Archivist of the United States. The case concerned email messages, some of which were identified as records, which were stored on White House computers. The Court held that the paper versions of those records did not necessarily reflect all of the information contained in the electronic version. For example, the paper record did not necessarily show the date and time the recipient received the email nor did it show who the recipient was if the email was sent using a distribution list or contained a long list of names that would not necessarily appear on the paper copy. Accordingly, if an agency does not have an electronic record keeping system, it must print the whole electronic record and file in the paper record keeping system. However, once the agency has moved to electronic record keeping, the print and file concept is no longer necessary for those email messages that qualify as Federal records, as they will be preserved and managed electronically" (The National Archives and Records Administration, n.d)

The Malaysian legal system is based on the UK legal system since it was once a British colony. The Malaysian legal system is a complex product of its history that is a mixture of predominantly British common law and separate Islamic law - Muslims are subject to Islamic / Syariah Law. There are few aspects of personal and family life that need to be regulated by state Islamic-based law referred to locally as Syariah law

rather than federal law. The rules of Syariah law are set by various sultans, who serve as Head of the Islamic religion in their respective states. Islamic laws are enacted by state legislatures, except for the Federal Territories (Kuala Lumpur, Labuan and Putrajaya) which are enacted by the Federal Parliament. However, the court system is “familiar to those from common law jurisdictions, but it also incorporates distinct characteristics in the form of Islamic religious courts and two separate High Courts for the Peninsula and for the Borneo states” (Tew, 2011, p3). The acceptance of email as evidence in court cases is related to the chronology of evidence since the 13th century when Emperor Frederick II proclaimed instruments written on paper to be invalid; acceptance of typewritten as evidence and similar case to electronic documents like email (Radhakrishna, 2012). Many electronic documents have been collected as evidence. Thus, the Malaysian Evidence Act 1950 was amended in 1993 to support this scenario. In this Act, the term evidence (in Section 3) is defined as “all documents produced for the inspection of the court: such documents are called documentary evidence” (Radhakrishna, 2012, p31). According to the Evidence (Amendment) (No. 2) Act 2012 in favour of the definition in the Computer Crimes Act 1997, cited that Computer “an electronic, magnetic, optical, electrochemical, or other data processing device, or a group of such interconnected or related devices, performing logical, arithmetic or storage functions, and includes any data storage facility or communications facility directly related to or operating in conjunction with such device or group of such interconnected or related devices,” is also a document which therefore accepted as evidence. In which explains the term ‘document’ under the Evidence Act means “a recording, or transmission, over a distance of any matter by any, or any combination, of the means mentioned in paragraph (a), (b), or (c)”¹. The acceptance of email as evidence has been proven in the Perak state of Malaysia where a decision was taken to accept email in the management of divorce case files and records by the family law section in Perak Islamic Religious Department, which is a religious organisation in one of the states in Malaysia that handles Islamic cases in Perak (Perak Islamic Religious Department, 2015).

¹ Refer to the Evidence Act 1950.

This confirms there is a precedence for the acceptance of emails as evidence in Malaysian state courts. Since emails have been accepted as evidence in court, even if as subordinate to other evidence, they need to be appropriately managed. “In the absence of guiding legislation, records managers must continue to be involved in the development and implementation of novel systems of electronic recordkeeping, which will ensure a “high probability” of admissibility into evidence of electronic records” (Piasecki, 1995, p.64) and, even in jurisdictions where email is accepted as evidence, to increase the probative value, or evidential weight, the court will assign to the evidence (Smith, 1996). According to Smith (1996), admissibility is an objective matter and the weight of the document to be accepted as evidence is subjective. The court has the authority to read or not read the document which means “no Code of Practice can ever guarantee that the document image (or any other document for that matter) will carry the day with the judge” (Smith, 1996, p72).

The development and implementation of legislation on email management to ensure email records are accepted and protected as evidence in business transaction of course helps the admissibility of email records as evidence specifically in a court case. “The rules of evidence may require that the email be authenticated and be introduced in a way that doesn't violate the general prohibition on hearsay evidence” (Snider, 2014). Discussions on the use of emails as evidence have mainly been conducted informally through legal blogs or websites (see Appendix 1).

2.4 Electronic Record Keeping Systems

The process of record keeping involves the use of record keeping systems to help users perform the tasks required. Record keeping systems are designed to capture records as evidence of business activities, to allow the management of records and to make them available upon request or when needed (Kennedy and Schauder, 1998). In the NARA Records Management Key Terms and Acronyms, a record keeping system is defined as “set of policies and procedures for organizing and identifying files or documents to

speed their retrieval, use, and disposition” (National Archives and Records Administration, n.d, p6), and is considered to be the same as a filing system.

An electronic record keeping system (ERKS) is a system developed to manage all records within an organisation to meet its record keeping needs (National Archives and Records Administration, 2000). It helps users to manage electronic records according to the functional requirements of the organisation. Such a system has been defined as “an electronic system that captures, organizes, and categorises records to simplify their preservation, retrieval, use, and disposition” (National Archives and Records Administration, n.d, p5). An ERKS can be integrated with other records systems such as an electronic document and records management system (EDRMS), defined by National Archives of Australia (2019, electronic document and records management system), as “an electronic document and records management system or EDRMS is an automated software application designed to assist you with the creation, management, use, storage and disposal of information and records. An EDRMS may also automate business processes such as workflows and approvals and be integrated with other business systems”.

Electronic record keeping systems have been developed to support record keeping in organisations. Rass (1999) stated that in an electronic record keeping system a software developer combines traditional records management practices with electronic document management features. Electronic record keeping allows information to be managed as an asset rather than a liability, and an electronic record keeping system can be an intellectual challenge for users since they need to understand how the software works and how it helps in organising records in the organisation (National Archives and Records Administration, 2016b). The objective of the implementation of an electronic record keeping system is to manage the organisation’s electronic records throughout their life cycle and to ensure the reliability and authenticity of the organisation’s records as legal evidence in business transactions and decisions (National Archives and Records Administration, 2016b).

An electronic record keeping system should be a system trusted by the people in the organisation for managing records. The user needs to trust the

system and the responsibility for creating this trust belongs to the records manager and the developer of the electronic record keeping system (Duranti, 2010). However, this can be challenging. According to McLeod et al. (2010, p17) “the people, process and systems or technology aspects of electronic records management are inextricably linked”. Their AC+erm project identified that issues related to “people are predominant, fundamental and challenging as they concern culture, philosophical attitudes, awareness of records management and electronic records management issues, preferences, knowledge and skills” (McLeod et, 2010, pii). One of the reasons people hesitate to use record keeping systems is because of a lack of trust, as stated by Oliver and Foscarini (2014). Records need to be trustworthy to fulfil the criteria needed for them to be evidence to provide accountability and to protect rights, to preserve the individual’s or organisation’s identity and to understand past events (Duranti, 2010). To encourage an organisation to trust an electronic record keeping system, records managers first of all need to convince IT specialists of its advantages and to assist them in developing it. In addition, the New South Wales Government (n.d) stated that an electronic record keeping system should possess the following characteristics in order to produce and maintain authoritative records: reliability, integrity, compliance, comprehensiveness, fixity and accessibility.

In the context of managing email, an electronic record keeping system should capture the content and structure of emails and ensure that they are reliable and authentic representations of the business activities or transactions in which they were created or transmitted. This involves the process of capturing metadata in the system and then any changes made can be tracked and audited by the system (ISO 16175:2, 2011). Three case studies related to email management were identified in the AC+erm project conducted in the Northumbria University (McLeod et al., 2010); this present case study will help to understand email record keeping in the government sector.

2.4.1 The Development of Electronic Record Keeping Systems

A variety of system designs for an electronic record keeping system may meet business needs and fit into the existing technical architecture of an organisation (National Archives and Records Administration, 2016b). The main requirement of an electronic record keeping system is that it needs to fulfil the needs of users and the organisation to provide audit trails so that records can act as evidence of transactions and make the business processes easier with the evidence. By meeting the functional requirements of electronic records in the ISO 16175:1 (2010) standard, the electronic record keeping system will meet the organisation's business needs. Preliminary preparations using a checklist may help the organisation to identify the criteria necessary when designing an electronic record keeping system. NARA (2016b) describe a number of starting points or options for electronic record keeping systems in their 'Fast Track' website. In the stand-alone option the electronic record keeping system does not directly interact with any other electronic record generating applications. The electronic record keeping system should also be able to be integrated with other desktop applications. Integration with an EDMS means that end users who create records interact with an EDMS in the foreground, while the EDMS interacts with the electronic record keeping system running in the background as part of the services supported by the enterprise's technical architecture (National Archives and Records Administration, 2016b). The final option is total integration within the design of the electronic information system. The functionality of the electronic record keeping system should be capable of defining the organisation's requirements and support its mission (National Archives and Records Administration, 2016b).

An organisation can choose among the options available in developing and implementing electronic record keeping systems. Each of the options is based on its requirements. The main objective of an electronic record keeping system is to help users to manage records according to records management principles.

One of the key building blocks of an ERKS is the corporate filing plan also known as a business classification scheme. This is difficult to design and implement since it has to connect records and business activities (Gregory, 2005). The process becomes even more complex because it may be different from the ways the user thinks, and the business classification scheme may not fit with their records. It is challenging for a records manager to design such a scheme. However, as Gregory (2005) explained, the best design for a corporate filing plan is based on the business functions, since these are less likely to change over time.

Various factors influence the success of an electronic record keeping system, including pre-defined business requirements (Raas, 1999), training and user-friendliness (Gunnlaugsdottir, 2009), and cooperation between IT staff and records managers (Zinner & Viborg, 2008). However, factors leading to the failure of the implementation of electronic record keeping system include lack of training and poor system design (Zinner and Viborg, 2008). Overall, the success of an electronic record keeping system does not rely on the records managers alone, it involves collaboration in many aspects such as managerial, technical, policy, and human issues. All aspects need to be addressed in both implementation and use (National Archives and Records Administration, 2016b).

2.5 Functional requirements for records in electronic office environments

The ISO 16175 (2010) standard ,”developed by a multi-national project team under the auspices of the International Council on Archives (ICA) between 2006 and 2008” (Cunningham, n.d), comprises three modules. Part 1 gives an overview and statement of principles (2010); Part 2 presents guidelines and functional requirements for digital records management systems (2011); and Part 3 offers guidelines and functional requirements for records in business systems (2010). The purpose of the ISO 16175 is to set out the requirements to encourage consistency and harmonisation in electronic record keeping systems (Cunningham, n.d). “These modules have four key audiences concern software developers and vendors, jurisdictional

standard-setters, government agencies and private-sector organisations” (ISO 16175:1 (2010, p2). This standard is relevant to refer in designing and implementing an electronic record keeping system. ISO 16175:1 (2010, p1) provides “internationally agreed principles and the functional requirements for software used to create and manage digital information in office environments”. The functional requirements listed represent guidance for records management practitioners and IT specialists in managing electronic records based on record keeping principles and also in designing electronic record keeping systems. It also provides guidelines for records in business systems and sets out the functional requirements for the management of information held in such systems (ISO 16175: 1 (2010).

Organisations in the government sector may refer to this standard functional requirements in order to improve consistency in designing and implementing the systems used to create and manage digital information and records. ISO 16175:2 (2011) concerning information management systems or electronic record keeping systems that developed to assist the organisations to control their records and have value as evidence of business processes. The digital records management systems link born digital and non-digital records known as hybrid record keeping system to business activities, and improve content, context and structure of records over time (ISO 16175:2, 2011).

The main attributes for digital records management systems such as “creating and capturing records in context, managing and maintaining records controls, maintaining records for as long as they are required, implementing records disposition and the management of records management metadata” (ISO 16175:2 (2011, p19). These attributes include additional activities to support the processes involved. The successful implementation of digital records management system in the organisation could meet legislative and regulatory requirements. Thus, the process of creating and capturing the content, context, structure and format of records includes the processes of identifying, classifying and combining records as evidence will help the organisations in making decisions. Records management metadata used to describe the context, content and structure of records in the digital records management systems (ISO 16175: 2, p23). Aggregations processes represent relationships of relevant records that held in the digital records management systems or physical records. It used a

standard classification file scheme to control these aggregations (ISO 16175:2, 2011, p24). Organisations could receive advice from the national archives in order to develop a file classification scheme. This scheme is crucial to the organisation since it helps to control the structure and contents of records link the records according to their similar group. System could be upgraded to a new version and it involves records migration. This requirement is needed to ensure records “can be retained for longer than the lifespan of the software system and there is a need to be able to export records when transitioning to a new digital records management system” (ISO 16175: 2, p25). Record information must be able to be migrated to other technology platforms and presented in a form that is readable.

The requirement to maintain the authenticity and reliability of records includes requirements for “access control and security, retention and disposal, maintaining metadata, hybrid record management and supporting the migration and export of records” (ISO 16175:2, 2011, p22). Records that are generated should be stored in the same processes and retrieval methods should be standardised. The record must be able to be accessed at any time. “The digital records management system should automatically alert an administrator that an alteration has occurred” (ISO 16175:2, 2011, p27).

Furthermore, verification and security procedures should prevent unauthorised additions, modifications, or deletions of records and ensure the protection of the system against such problems as power interruptions (Federal Government of the United States of America, 2000). For access to records, the system needs to provide search tools to aid in search and retrieval processes. “The digital records management system shall be able to capture and maintain metadata relating to physical records to support a hybrid record keeping system” (ISO 16175: 2, 2011, p28). The system should allow rendering process in order for users to view records either in visual or hardcopy format (ISO 16175:2, 2011). The rendering process should be applicable to records such as audio or visual format which cannot be printed. The final requirement for a digital records management system is to enable the administration of the records management systems, including the maintenance of access groups’ management of system parameters and provide back-up facilities. The digital records management system shall allow data restoration, generate system reports and manage

metadata (ISO 16175:2, 2011). This maintenance process for the records ensures that the system is able to support records management.

Part 3 of ISO 16175 (2010, p1) “helps organisations to ensure that evidence (records) of business activities transacted through business systems are appropriately identified and managed”. Business system is developed to support business activities and this module “develop requirements for functionality for records to be included in a design specification when building, upgrading or purchasing business system software” (ISO 16175:3, 2010, p2).

In business processes records need to be managed accordingly to the records management principles to improve transparency and “assist in deciding a quality decision-making” (ISO 16175: 3, 2010, p5). However, the requirements for particular business system are flexible and based on the business activities and needs. Overall, in designing the system, the requirements include the functionality for records such as records creation and maintenance as to ensure that records are retaining as evidence. Similar to ISO 16175:2 (2011), this third module need to ensure that a business system is able to support access control, security, retention, disposal and migration of records. Business system should be able to retain and dispose of records as required in business systems in a managed, systematic and auditable way. Overall, the functional requirements emphasise records used in the organisation either using business systems or in applying a record keeping system. The functional requirements of ISO16175 apply if records are managed within a business system or are managed externally by export to or integration with a dedicated records management system. The requirements are generic and may need to be adapted to the agency's particular business needs.

2.6 Conclusion

Three major aspects related to email management in organisations emerged in the literature. These concern the systems, processes and people that are involved in email record keeping. Systems have been developed by IT specialists and guidelines given by National Archives. However, there is a lack of detailed case studies related to this topic, and only three could be found in the AC+erm project which were related to email management. An electronic record keeping system is necessary to manage email records to retain the value and accepted as evidence in business processes to meet the legal obligations. Thus, the electronic record keeping system needs to refer to the functional requirements for records in electronic office environments to ensure the system implemented is harmonised and standardised to manage records in the organisations.

CHAPTER THREE

METHODOLOGY

This chapter considers the research design and methods used in this study. It begins with a discussion of methodological approach and continues with a justification for selecting a case study strategy that applied a variety of techniques for data collection and analysis. This chapter concludes by exploring how this study satisfies the requirements of the validity and reliability of the research.

3.1 Philosophical Worldview

The understanding on “social practices and phenomena in relevance environmental management, as well as relating the work of natural and social sciences researchers” has been raised (Evelly et.al., 2008, Introduction).

Philosophical ideas may remain invisible in research (Slife and Williams, 1995 as cited in Creswell and Creswell, 2018), but they still provide inspiration for research practice and need to be recognised. Four main philosophical ideas concerning research can be highlighted: “postpositivism, constructivism, transformative and pragmatism” (Creswell and Creswell, 2018, p6).

Constructivism is a research perspective typically seen as an appropriate approach to qualitative research. The goal of such qualitative research is to rely as much as possible on the participants’ views of the situation being studied (Creswell and Creswell, 2018). As discussed by Crotty (1998) cited in Creswell (2009, p8), “open-ended questions tend to be used in qualitative constructivist research so that participants can share their views”. This study used constructivism as the research philosophy.

This research has adopted a constructivist philosophical approach in seeking critically explore the management of email in the context of the transition to digital record keeping in the government sector, focusing on Malaysia. Constructivist used to engage with user practices in managing email and gain their perspective on email management.

3.2 Methodological Approach

A research methodology is the theoretical perspective of the research that is the overall nature of the research activity, although the term is applied to many aspects of the research process in various disciplines. (Pickard, 2013, pxvii). It a “set of plans and the procedures for research that involve all of the steps from a wider perspective to the detailed methods of data collection, analysis and interpretation” (Creswell and Creswell, 2018, p16). Research methodologies can be categorised into two fundamental types viz. quantitative and qualitative research (Gorman and Clayton, 2005). However, a third type, mixed methods research is located in the middle of this continuum because it incorporates elements of both approaches (Creswell and Creswell, 2018). One of the most important differences between qualitative and quantitative research is that qualitative tends to use more words to represent findings and open-ended questions in data collection whereas quantitative research uses numbers to represent findings and closed-ended questions in data collection (Creswell and Creswell, 2018). A researcher needs to consider many factors before selecting the appropriate research methodology in the light of various aspects of the research topic and subject (Remenyi, 1998). A methodology provides an angle or viewpoint concerning the direction the researcher wishes to take in answering the question being asked (Pickard, 2013). The research methodology is used in order to ensure that the research objectives will be successfully achieved by collecting the appropriate data.

Social sciences research is a coherent body of thought about a topic over which there is a broad consensus among its practitioners as to its properties, causes and effects (May, 2011). Table 4 summarises the methodological approach adopted for this research and this is examined in more detail in the remainder of this section.

Research Methodology	Qualitative
Research Method	Case Study
Research Technique	Interview Observation Content Analysis (Policies/Guidelines)
Research Instrument	Human System Documentation

Table 4: Methodology Used for the research

3.2.1 Qualitative Methodology

Research methodology derives based on research subject from the human experience (Maykut and Morehouse, 1994). The constructivist paradigm uses qualitative methods (Guba and Lincoln, 1985). Qualitative research can be described as “a set of interpretive activities that seek to understand the situated meaning behind actions and behaviours, and analysis relies on the researcher’s skills in interpreting the data using distinct specific sub-types of text-based research such as content analysis” (Sinkovics and Alfoldi, 2012,p3-4). In qualitative research, the method adopted is to use a progressive approach focusing on particular issues which require “a systematic narrowing and refinement focus during fieldwork” (Sinkovics and Alfoldi 2012, p4). Qualitative research, is generally used “to observe people’s words and actions in narrative or descriptive ways more closely representing the situation as experienced by participants” (Maykut and Morehouse, 1994, p2-3)

3.3 Research Design and Process

Research designs, also known as strategies of inquiry (Denzin and Lincoln, 2013; May, 2011), are developed to answer the research aim(s) or question(s) The research problem determines the type of research design developed; the research design then helps in executing and performing the chosen tasks easily and in a systematic way (De Vaus, 2013).

The research process enables the researcher to identify and define the research problem, specifically in terms of what is to be researched. Three phases approach to the qualitative research process has been proposed by Pickard (2013).

These phases were adopted to conduct the research. Phase One is Orientation and Overview that begin with developing the research questions and finding a research design appropriate for investigating the questions (see 1.4). It also identified and reviewed relevant literature (see Appendix 1) and identified keywords that are relevant to the research topic. Appendix 1 shows that sources for literature where it started from general topic on email in search engine and online databases and narrow down to particular subject. From large numbers of suggestions, most relevant source chose to refer and listed in Bibliographies. Phase One also entailed choosing a sample and a context. In qualitative research, this generally requires purposive sampling, defined by Teddlie and Yu (2007) as “selecting units (e.g., individuals, groups of individuals, institutions) based on specific purposes associated with answering a research study’s questions”. A Malaysian ministry, (the Ministry of Communication and Multimedia, was selected for the case study. Techniques for data collection has determined at this phase that are semi-structured interview including observation to supplement data interview.

Phase Two, also known as Focused Exploration, is the crucial stage of collecting empirical data. Based on the literature review, preliminary interview questions were designed (see Appendix 2) using the records continuum model as a framework (see Appendix 3). The records continuum model (Upward, 1996, 1997, 2000) seemed a most suitable model for investigating email record keeping in the government sector and, hence, was adopted in creating the interview questions for the research.

Upward (2000, p118) argues that the records continuum model is “a fully-fledged paradigm shift in which a worldview is being replaced”, that worldview being records lifecycle, which is based on “the separation of space and time” (Upward, 2000 p120). The structural principles of the continuum model are that it “stresses” the use of records “for transactional, evidentiary and memory purposes ... [and] unifies approaches to archiving/recordkeeping”; it focuses “on records as logical rather than physical entities, regardless of whether they are in paper or electronic form”, and it identifies “the need to integrate recordkeeping into business and societal processes and purposes” (Upward, 1996, p. 5). Despite its format independence the model was developed to address the challenges of

managing electronic records, a role for which Flynn (2001, p85) concludes it “is well adapted.” As Yusof and Chell (2000, p137) state “the continuum seems to be the best concept to manage electronic records”. Van Bussel (2017, p28) notes that “the theory is not about the archives themselves, it is about the information management activities that add new contexts to them such as capturing them into systems, or adding metadata.” McKemmish (2005) illustrates this in her description of how the evidence in the Australian case of the Children Overboard could have been better by applying the continuum concept to managing the records as evidence. “In the story of the Children Overboard, we can see that records take many different forms and are recorded in many different media ... we see records as dynamic objects, fixed insofar as their original content and structure can be re-presented, but 'constantly evolving, ever mutating' ... as they are linked to other records and ever-broadening layers of contextual metadata that manage their meanings, and enable their accessibility and usability as they move through spacetime.” (McKemmish, 2005, p14). Similarly, managing email records is a dynamic process since it involves different formats of attachment such as pictures, audio, video etc. One of the challenges for the record manager and archivist is ensuring the email records can be accepted as evidence in a business transaction. As Oliver and Foscarini (2014, p152) state the model helps to ensure the “characteristics of records as authentic, reliable, having integrity and useable is widely acknowledged” and underpins their acceptance as evidence.

The interview questions were different based on the participants' roles in the Ministry and organisations. An interview guide was created by researcher before interview session (see Appendix 4). The numbers of questions asked to PICs were 64 (see Appendix 5) and Operational Staffs were 30 questions (see Appendix 6). The numbers of questions for both NAM and MAMPU were differences based on their subject expertise (see Appendices 7 and 8). The types of questions were designed based on open-ended questions that “allow interviewee to tell their own story in their own words” and multiple choices (Pickard, 2013, p199). Interview notes helped the preliminary analysis of the data (see Appendix 9).

Phase Three, also known as Member Checking, consists of a constant comparative method used to analyse the data and identify the selected

themes by using coding method. Descriptive analysis was used to analyse the data based on coding from constant comparative method, selected theme were describe and analyse as narrative and insert as findings. This research used the constant comparative method for analysing the data. Finally, the discussion of findings and summary of the contribution to knowledge (Chapter 7) to complete this research.

3.4 Case Study

The research method was a case study. This enabled an in-depth investigation of a contemporary phenomenon (the case) to be conducted within its real world context (Yin, 2014). The phenomenon I this study was email record keeping and the real world context was the Malaysian Government (Yin, 2003). For practical reasons it was necessary to focus on one government Ministry. An investigation of the selected government sector in Malaysia may be designated as an instrumental case study (Stake, 1994, p237) that use to investigate a particular phenomenon that is email record keeping (Pickard, 2013, p102). There are many arguments against the use of case studies, and “most textbooks on research methodology tend to describe case studies as a linear process” (Dubois and Gadde, 2002). The main arguments against case studies have been that they provide little basis for scientific generalisation (Yin, 1994). However, the method is applied extensively in a wide range of subject areas such as psychology, sociology, political science, anthropology, public administration and public policy Yin (1994) and also information science. The purpose of undertaking a case study is to explore the uniqueness of the single case (Simons, 2013). In this research, the study population consisted of three departments in the Ministry of Communications and Multimedia of Malaysia and NAM and MAMPU have been included as population based on literature review where both were found as policy makers that are related to email record keeping. There are 1 Chief of the Secretary to the Ministry Office in the Ministry, 3 departments and 9 agencies in the Ministry. The 3 departments have been chosen as populations since they are the main bodies and biggest population in the Ministry comparing to other agencies. The main function of the Ministry is planning, developing, implementing and monitoring policies and regulations related to information technology and it security and integrity, communications and multimedia. Since the function is information and

communication related they matched well with the study focus (email record keeping) and were the main justification for selecting this Ministry. Once the case had been identified, the sampling method to be used was determined. Many factors needed to be considered, including the research aim and questions. As Denzin (2009) stated that, "all sampling activities are theoretically informed". Thus, the appropriate concepts gained from the literature review and the research questions provided the focus for both the site and sample selection (Marshall and Rossman, 2006). "Purposive sampling is widely used in qualitative research for the identification and selection of information-rich cases related to the phenomenon of interest" (Palinkas et.al, 2015, p553). The case itself (the Ministry) was purposively selected on the grounds of its responsibilities and likewise the respondents were purposively sampled. The participants were selected based on email contacts from liaison officers in the selected Ministry, NAM and MAMPU. Staffs in the three selected departments were identified based on the suggestions of the Person in Charge in each of the selected departments. They represented senior to lower level management in each departments - a Records Officer, three Persons in Charge (one from each department that has a in a particular department and playing role as senior officer to the operational staff) and six operational staff (two in each department). Staff from NAM and MAMPU were selected because of their key roles in managing government records and DDMS implementation. The key personnel interviewed from NAM were heads of departments and in MAMPU they were deputy heads of departments.

3.5 The Ministry of Communication and Multimedia

Malaysia

The former Ministry of Information, Communication and Culture is currently known as The Ministry of Communications and Multimedia Malaysia, due to the restructuring of the cabinet that was announced by the Prime Minister of Malaysia, YAB Dato' Sri Mohd. Najib bin Tun Haji Abdul Razak, on May 15, 2013.² The Ministry is divided into three main departments, each of which has many divisions (see Figure 1). The first department is the Management Department with six divisions. Human Resources Management is responsible for the management of the organisational structure, staff performance and career development, staff training and examination. The Finance division is responsible for managing the financial budget of the Ministry. The Development division manages, supervises and monitors physical projects conducted by the ministry and its agencies. The Management Services division is responsible for providing administrative support to the ministry. The Accounts division is responsible for organising training and courses, and providing technical advice related to finance and the accounting system used by the ministry. Finally, the Information Management division is responsible for preserving the integrity of electronic data and the sharing, promotion and dissemination of information.

The second department is the Operations Department which has four divisions. The PUSPAL Unit (Central Agencies Committee for Applications for Filming and Performances by Foreign Artistes) is responsible for receiving and processing applications for filming and performance by foreign artists. Control and Compliance is responsible for planning, coordinating, implementing, monitoring and ensuring the development of communications and multimedia industry in Malaysia is efficient. The function of the Strategic Communication division is to monitor and analyse current issues from the variety of media resources for instance newspapers and social media. The final division, Infrastructure and Application, is responsible for planning, coordinating, implementing and monitoring the implementation of projects which ensure that the communications infrastructure can be accessed and is economical to use nationwide.

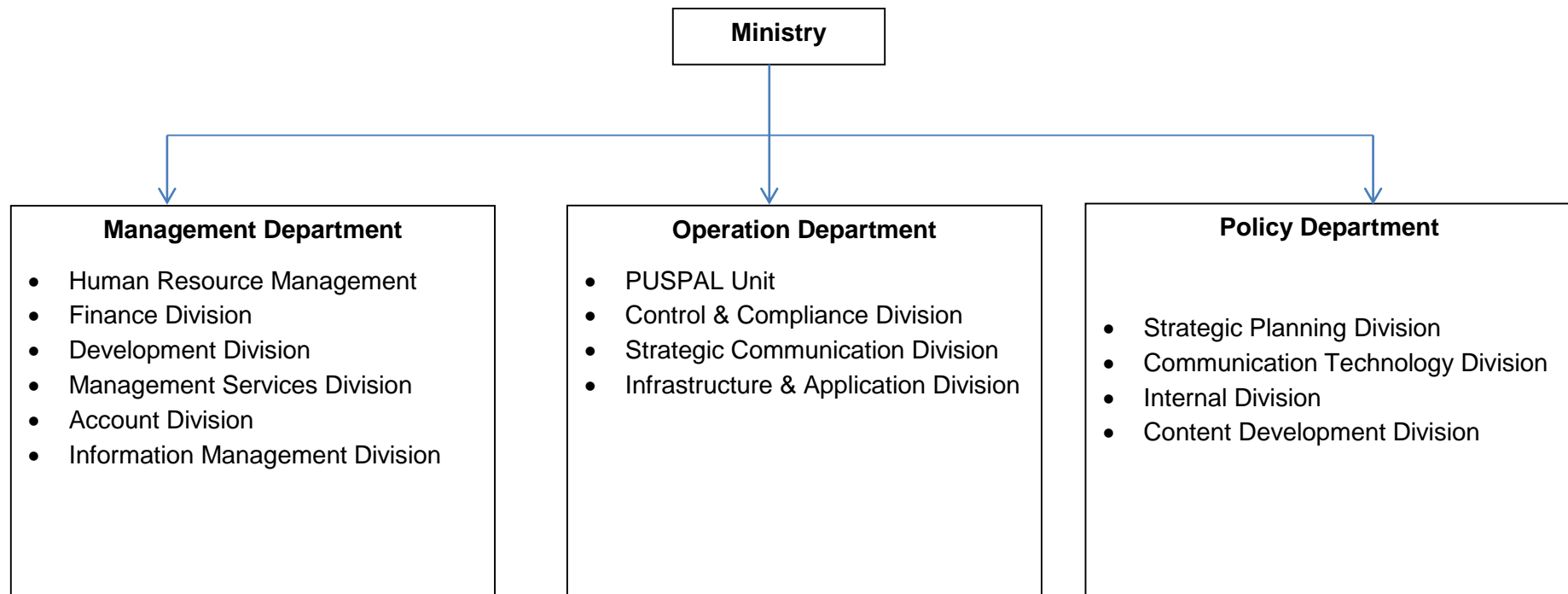
² Former Prime Minister of Malaysia

The third department is the Policy Department also with four divisions. Strategic Planning is responsible for planning, conducting research, implementing and monitoring the ministry's policies. The Communication Technology division's function is to plan, formulate, coordinate and implement communication policies in general and in particular those with regards to international relations, such as in the liberalization of the services sector, communications and related issues. The International division is responsible for managing the relationships between Malaysia and other countries in the field of communication and multimedia. Finally Content Development which is responsible for developing a database repository for creative industry project evaluation and for improving the resource sharing and experience among entrepreneurs in the communications and ICT industries.

As the Ministry and both policy makers (NAM and MAMPU) have been identified as research populations, consent letter have been sent (see Appendix 10 and 11 as examples of consents letters to the Ministry and one of policy maker).

The name of each department has been anonymised for example: Management Department as Department 1 for readability in thesis.

Figure 1: Organisational chart of the Ministry of Communications and Multimedia Malaysia



3.6 Data collection

The data for this study was collected from interviews, observations and official documents because a single method may not shed adequate light on the situation or phenomenon investigated. Using multiple methods can also help the researcher to achieve a deeper understanding of the research topic. Ten interviews were conducted with Ministry staff, three heads of departments at NAM and two deputy heads of departments in MAMPU. Table 5 summarises the research questions and objectives, the research participants and other data sources, and the data collection techniques and analysis.

3.6.1 Interviews

Interviews were the main data collection instrument used in the research. Respondents were asked some preliminary questions on the research topic through email prior to the face-to-face interviews in their own workplace. The records continuum model (Upward, 2000) was adopted in designing both sets of questions (see section 3.3).

The focus was principally on the first three dimensions of the model (create, capture and organise) rather than the pluralize perspective since the objective of the case study was to explore how email was being created, captured and organised by government staff themselves rather than how they might be treated subsequently by records professionals.

The questions were aligned to the research objectives and categorized as concerning policy, record keeping systems and guidelines. However, during the data collection two sets of questions were prepared which consisted of Preliminary Questions set that were distributed to the Ministry and NAM or MAMPU. Each Person in Charge of the Ministry was asked 18 questions during the preliminary questioning. Eight questions were asked of the five Heads/Deputy Heads of Department during preliminary questioning at NAM or MAMPU. The preliminary questioning was conducted via email. However, only MAMPU1 was responded and answered the email and the rest were prefer to answer the preliminary questions during interview sessions. The second set of questions consisted of 64 questions were asked during the interview sessions which involved a Records Officer, three Persons in

Charge and six Operational staff at the three departments in the Ministry. In Department 2, the initial plan was to interview staff in a second division since its function was directly related to the research topic, however, given that the Division's data is confidential, and this was not possible. Thus, the interview was conducted at fourth division. Information sheets, letters and consent forms were prepared before conducting the interviews to fulfil the ethical requirements of the study (see 3.9 and Appendix 12 for personal consent form and Appendix 13 for ministry consent form). The interview were conducted in Malay and were translates from Malay to English for selective coding process. Therefore some of the quotes are having grammatical issues. An interview guide was created by researcher. Then, semi structured questions were developed to ask questions for interviewing sessions. Semi structured interviews were used to gain "about the point of view" from the interviewees (Pickard, 2013, 1999).

3.6.2 Observation

Observation is a technique in which the behaviour of research subjects is watched and recorded without any direct contact. It was used in this study to gather first-hand information. The researcher visited the organisation and the participants' work area in the Ministry. Ministry employees were observed directly as they performed their duties in using email records, the email system and the DDMS. Photographs of the DDMS interface, duplicate system by OP1D2 and register for decentralised registry were taken which are included in Appendix 14. Based on the observations, notes were taken of key points and used to supplement the interview data. However, observations were used to supplement the data.

No	Research Objectives	Research Question	Participants / Sources	Data Collection Techniques and Analysis
1.	To explore the legal and regulatory environment in relation to the Malaysian Government and the information it creates and holds.	What is the role of the National Archives of Malaysia and MAMPU in providing guidelines for managing email in the government sector in Malaysia?	<ul style="list-style-type: none"> Email and related policies and guidelines NAM MAMPU Records Officer Person in Charge 	<ul style="list-style-type: none"> Interviews Content Analysis
2.	To explore the evolution of email record keeping by the Malaysian Government	Why and how does the government sector in Malaysia manage and integrate email records in the overall context of record keeping?	<ul style="list-style-type: none"> NAM MAMPU Records Officer Person in Charge Operational Staff 	<ul style="list-style-type: none"> Interviews Observation
3.	To critically review existing policy, guidelines and systems for capturing and managing electronic mail in the Government of Malaysia from a record keeping perspective.	To what extent are the guidelines effectively aligned with the functional requirements of electronic records management?	<ul style="list-style-type: none"> Email and related policies and guidelines NAM MAMPU 	<ul style="list-style-type: none"> Content analysis
4.	To investigate the current practices in managing email in a selected part of the Malaysian Government and to evaluate these against existing policies and guidelines.	What tools and mechanisms are needed for the effective management of email as a record?	<ul style="list-style-type: none"> NAM MAMPU Records Officer Person in Charge Operational Staff 	<ul style="list-style-type: none"> Interviews Observation

Table 5: Research questions, objectives, respondents or sources and techniques

3.7 Data Analysis

A typical qualitative case study generates three types of verbal data, namely interview transcripts, observation notes, and field documents (Winegardner, 1999). All three data types were collected in this study along with official documents relating to email record keeping in the Malaysian Government. There are two units of analysis: the organisation and the individual. The data analysis involved examining the data and identifying, coding, and categorising it according to the main themes, topics and patterns within it. Data analysis is a practice in which raw data is ordered and organized so that useful information can be extracted from it. According to Maykut and Morehouse (1994, p112), the process of qualitative data analysis can involve many procedures, but it is “a non-mathematical analytical process which includes the investigation of the meaning of people’s words and behaviour”. Coding is essential in the analysis of qualitative data (Patton, 2002). “To codify is to arrange things in a systematic order, to make something part of a system or classification, as to categorize” (Saldaña, 2016, p8). When codes are applied and reapplied to qualitative data, the codifying process permits data to be “segregated, grouped, regrouped and relinked in order to consolidate meaning and explanation” (Grbich, 2007, p21). Bernard (2006) succinctly states that this analysis “is the search for patterns in data and for ideas that help explain why those patterns are there in the first place”. “Coding is thus a method that enables similarly coded data to be organised and grouped into categories or “families” because they share some characteristics” (Saldaña, 2016, p8).

The amount of data generated in qualitative research can be extremely large, and making sense of pages of interview and field notes data can be overwhelming (DeNardo and Levers, 2002). Specialist software, such as NVIVO or ATLAS*TI (Zamawe, 2015) can be used to store, the codes along with the location of the appropriate passage of text so that the “researcher can navigate and browse the data” associated with a certain topic (Patton, 2002, p443). However, this is not essential and for this study the data and coding were managed using MS Word and MS Excel. The critical aspect of qualitative data analysis is the human element where the researcher immerses themselves in the data collected and tries to understand and interpret its meaning. Based on the coding, the process of generating a

description of the setting as well as categories or themes for analysis took place.

3.7.1 Constant Comparative Method

The method of constant comparative analysis was used to analyse the data. According to Glaser (1965), the constant comparative method can be implemented in any qualitative study involving interviews, observations and printed sources of data and others. The purpose of the comparison is to explore the uniformity and differences within the data from the different participants.

The constant comparative method of analysis is conducted in four stages: “comparing incidents applicable to each category; integrating categories and their properties; delimiting the theory; and writing the theory” (Glaser, 1965, p439). The main tool used is comparison. The method of comparing used during analysis are by creating groups, establishing the barriers of the groups, conveying the segments to groups, summarizing the content of each group, finding negative evidence, and so on. The aim is to distinguish theoretical similarities to improve the discriminative of groups of data and to determine configurations according to particular themes (Tesch, 1990).

As explained by O'Connor, Netting, and Thomas (2008, p41) constant comparison ensures that all “data is analytically compared with all other data so that all data produced is analysed rather than potentially ignored on thematic grounds”. Data are compared during the process of coding (Fram, 2013). There are three stages of coding in this research included open coding, axial coding and selective coding (Corbin and Strauss, 2008). This process begins with open coding to develop categories from the first round of data reduction, and then further reducing and recoding allows possible core categories to emerge (Fram, 2013; Charmaz, 2001; Glaser, 1978; Glaser and Strauss, 1967; Strauss, 1987). Open coding was the process of “when you are going through the data you often mark important sections and add descriptive name or ‘code’ to it” (Khandkar, 2014, p1) (see Appendix 15 for an example of an interview transcript and Appendix 16 for an example of open coding using the comment tool in Microsoft Word).

The data coded from the interview transcript was in Malay since the interviews were conducted in Malay. Then, selective data will be translated to English. Second stage of coding was axial coding that “consists of identifying relationships among the open codes” (Gallicano, 2013, p1). According to Flick (2014, p408), the purpose of axial coding is to “clarify the relations among a phenomenon, its causes and consequences, its context, and the strategies of those who are involved”. The open coding, captured in the comment tool in Microsoft Word, was transferred to Microsoft Excel to identify the emergent themes and links between the codes and research objectives (see Appendix 17). The final stage of coding was selective coding that “will involve identifying one or two core categories to which all other categories that are linked as subcategories” (Pickard, 2013, p272) (see Appendix 18 for an example of mind mapping of selected themes and the number occurrences in the axial coding). Selective coding is “the process of integrating and refining the theory” (Strauss and Corbin, 1998 p143). In this study, this process was used to compare each data set taken from every interviewee taking into account their role, the organisation concerned, the department and any guidelines provided. The, comparison of data in each department, comparison of data between PICs within departments, and comparison of data between Operational Staff were developed to seek similarities and differences between data sets. They are summarised in table format and narrative in Appendices 19, 20 and 21.

Official documents related to email management in the Malaysian Government and also its national benchmarking countries for archives and records management that are the United Kingdom, Australia and the United States of America, were analysed and summarised (see Tables 1, 2, 3 and 8).

3.8 Trustworthiness of Data

“Understanding the methods of establishing the ‘truth’ of research is essential for researchers and they must understand that it is inappropriate to judge methodologies using criteria that are not only misleading, but fundamentally wrong” (Pickard, 2013, p20). When doing qualitative research, the researcher must deal with the issues of the trustworthiness of data. As Sandelowski and Barroso (2002, p74) observed, “scholars across social sciences disciplines have sought to define what constitutes a good, valid, and or reliable qualitative study and have charted the history of and categorised efforts to provide such a definition, and to describe and codify techniques for both ensuring and recognizing good studies”. The issue of trustworthiness is related to the reliability and validity of the findings. In qualitative research, dealing with issues of reliability and validity is important in ensuring the credibility of any study (Kirk and Miller, 1986); Silverman (2001) cited by Peraklya, 2004). Lincoln and Guba (1985) identify four categorises of trustworthiness in qualitative research, which are internal validity, external validity, reliability and objectivity. However, Shenton (2004) pointed out that in the mid-1990s, the criteria for determining the trustworthiness of qualitative research were still emerging and being defined, while those suggested by Lincoln and Guba (1985) have been accepted by many practitioners and researchers.

3.8.1 Credibility

Credibility is the internal validity of the research (Lincoln and Guba, 1985). To address the credibility of this study triangulation was employed Patton (1999, p1197) identify “different types of triangulation-methods triangulation, triangulation of data sources, investigator or analyst triangulation, and theory triangulation are all strategies for reducing systematic bias in the data. In each case the strategy involves checking findings against other sources and perspectives. Triangulation is a process by which the researcher can guard against the accusation that a study's findings are simply an artifact of a single method, single source, or a single investigator's biases”. For this study, the consistency of findings from the interviews, work place observations and official documents was checked, and triangulation of sources was used to identify the consistency of responses between participants. In qualitative research the researcher roles is significant to tackle participant to answer semi structured interviews questions (Patton, 2002). Thus, the credibility of

qualitative research depends on the ability and effort of the researcher in the way of extracting the data later.

3.8.2 Transferability (external validity)

A second criterion to ensure trustworthiness is the transferability of findings, which involves the study's external validity. By describing a phenomenon in sufficient detail, one can begin to evaluate the extent to which the conclusions drawn are transferable to other times, settings, situations, and people. Descriptive analysis was used to analyse the data based on coding from constant comparative method, selected theme were describe and analyse as narrative and insert as findings. Descriptive analysis involves a broad depiction of a case or phenomenon. The study conducted on a single-case study which gave the real picture of one place. The findings are based on the current situation of email record keeping in the government sector in Malaysia, which is applicable for other government departments to follow. This single case study represents an example within a broader group in Malaysia, so transferability can be accepted.

3.8.3 Dependability (reliability)

Shenton (2004) describes the process within the study should be reported in detail to address the dependability issue. "Thus, an auditing trail is outlined in order to check procedural dependability in the following areas for instance the raw data, their collection and recording" Flick (2014, p392). Therefore, the understanding of the research can be explained by the elaboration on research design and details of data gathering in the study to show dependability of the research.

3.8.4 Conformability (objectivity)

The last criterion in trustworthiness is conformability or objectivity. Shenton (2004) stated that conformability is the qualitative investigator's equivalent concern to objectivity. Seale (1999, p45) argues that "auditing could be used to establish conformability in which the researcher provides a methodological self-critical account of how the research was done". "The findings must reflect the participants' voice and conditions of the inquiry, and not the researcher's biases, motivations, or perspectives" (Lincoln and Guba, 1985 cited in Elo et al., 2014, p6). Table 6 illustrates the quality criteria of trustworthiness of data

and information as described by (Lincoln and Guba, 1985) and discussed by Shenton (2004) and the actions taken in this study to address its trustworthiness.

QUALITY CRITERION	ACTIONS TAKEN IN THIS STUDY
Credibility (internal validity)	An interview guide was used to conduct semi structured interviews with all participants. The workspace environment was observed and photographs were taken to supplement data during data collected. Triangulation was used in gathering data (interviews and observations)
Transferability (external validity/generalisability)	A descriptive analysis of the case study was produced
Dependability (reliability)	The practices of email record keeping at the ministry were identified.
Conformability (objectivity)	Detailed explanations are provided of the methodology used in the study including face-to-face interviews to understand real experience from participants.

Table 6: Four Criteria for Trustworthiness

3.9 Ethics in the Research

“Research is a complicated activity in which it is easy for well-meaning investigators to overlook the interests of research participants” (Sieber, 1992, p1). An understanding of research ethics is required to ensure that the research is conducted appropriately and the participants are protected. Research must take place with appropriate ethical oversight (George, 2012). Ethics are importance when conducting and writing up research (Sternberg and Sternberg, 2010). The topic studied had the potential to be politically sensitive since it was conducted in the government sector and, as it involved several government agencies in Malaysia, the anonymity of the participants and departments was vital. Confidentiality means that results should not be disclosed to anyone not connected with the research where identification of the participants would be possible. In order to ensure that both the participants and researchers know their roles, informed consent is used to gain the agreement of both parties. Before the participants begin their involvement in

the study, they were required to give informed consent to participate in it. In the informed consent procedure, the participants were told about the aim of the research and what would be involved (Sternberg and Sternberg, 2010). Informed consent serves to protect the various organisations involved in the research. In this research, a (study) information sheet and consent form were sent to each participant and the organisations (The Ministry of Communication and Multimedia Malaysia), the policy makers (NAM and MAMPU) (see Appendix 11 and 12 as stated in section 3.6.1). Participants were also told that they could withdraw from the study without penalty at any time. This research adhered to the Northumbria University Research Ethics policy (Northumbria University, Newcastle, 2015) and received ethics approval.

3.10 Conclusion

This research adopted a qualitative methodology and undertook an in-depth case study that involved three government agencies in Malaysia. Data was collected from staff with different roles in three different departments in one particular Ministry, and from two core government agencies with specific responsibilities relevant to the study, viz. system design, and policies and guidelines development. Triangulation was used to assess the consistency of responses data to enhance the trustworthiness of the findings. Data analysis was accomplished using the constant comparative method, and the study was conducted in line with Northumbria University's Ethics policy.

CHAPTER FOUR

CASE STUDY: MALAYSIAN GOVERNMENT

This chapter provides information concerning the case study which was a selected Ministry in the Malaysian Government Ministry. It starts with a brief summary of the history of Malaysia and its record keeping, including discussion of Vision 2020, the Multimedia Super Corridor (MSC), electronic government, and the Digital Document Management System (DDMS). It concludes with a summary of the chapter.

4.1 The History of Malaysia

The history of Malaysia begins during the Melaka Sultanate, around 1400 AD (Department of Information Malaysia, 2008). At the peak of its glory, the imperial territory covered most of the Malay Peninsula and the East Coast of Sumatra. Melaka developed as an outstanding government because of its strategic location that was a meeting point between East and West Asia. This made Melaka the main trading centre in Southeast Asia. Islam emerged as a major religion at that time and became the main religion of the residents of Melaka; the King himself converted to Islam. In 1511, the Portuguese conquered Melaka. This was the beginning of the colonial era followed by Dutch rule starting in 1641, and finally the British in 1824. The British ruled Malaya for the longest time and were involved in the administration of the whole country (Department of Information Malaysia, 2008).

In the 1920s and 1930s, the residents of Malaya began to seek education. The education syllabus developed either locally or from the Middle East. An educated class developed and they were the ones who first expressed a spirit of nationalism. However, by the end of 1941, the Japanese invaded Malaya. The Japanese occupation ended in 1945 due to the bombing of Hiroshima and Nagasaki. This gave the Communist Party of Malaya (CPM) a chance to take over Malaya, but it failed. The British returned and introduced the Malayan Union. The emergence of Tunku Abdul Rahman (the first Prime Minister of Malaysia) led to the formation of an alliance that combined the three major races in Malaya, who were the Malays, Chinese and Indians, and forced the British to give Malaya independence. As a result, the London Agreement was signed on 8 February 1956, which stated that Malaya would be independent on 31 August 1957. After independence, there

were issues involving the territories of Singapore, Sabah and Sarawak as part of Malaya. However, the desire to form a country called Malaysia was realised on 16 September 1963.

4.2 Federal and State Government

Public administration is essential to ensure the smooth development and successful achievements of the nation. According to the Malaysian Government (2010), the executive power of the federal government belongs to His Majesty the King or the Head of the Malaysian state. At a Seminar on the Constitution of Malaysia at The National Archives of Malaysia (Aziz, 2012) it was stated that the Federal Constitution appointed His Majesty the King as the Head of the state of Malaysia, which is comprised of three government bodies, namely the body Legislator (legislative), the Administration (executive) and the Judiciary (judiciary). In Subject 44 in the Federal Constitution states that His Majesty is the third component of Parliament (Aziz, 2012). His Majesty the King has discretionary powers to choose the Prime Minister who has gained the support of the majority of Parliament members. The Prime Minister's main task is to chair the Cabinet and lead the government in national policy making (Malaysian Government, 1999).

Malaysia's Federal Government has a great and unique history of transition based on culture, freedom of human rights and loyalty to His Majesty the King and the Constitution. However, the Malaysian Constitution has been reviewed at various times and it has been amended and modified with approval from the government leaders (Deraman, 2016). The Federal Constitution was formed based on the 1957 Reid Commission which was adopted by the Federation of Malaya. Alongside the federal government, there are the state governments. The structure of the state governments is comparable with the federal government. The chief executive is empowered by the Sultan, King or Chief Minister of the respective state (Az, 2013). The differences in responsibilities between the two levels of governments can be divided into three sections which are related to federal responsibilities, state responsibilities and shared (also known as concurrent) responsibilities. These are summarised in Table 7 which is based on information from the Commonwealth Legal Information Institute (2018). Federal government has a major responsibility where it is responsible at country level and centralised

the whole government sector. State government generally is sharing the same responsibility as federal government but only for a particular state. However, shared responsibilities are sharing task between federal and state that need to work together.

No.	Federal Responsibilities	Shared (Concurrent) Responsibilities	State Responsibilities
1.	Foreign affairs.	Social welfare	Except with respect to the Federal Territories of Kuala Lumpur and Labuan, Islamic law and personal and family law of persons professing the religion of Islam
2.	Defence.	Scholarship	Except with respect to the Federal Territories of Kuala Lumpur and Labuan, land.
3.	Internal security.	Protection of wild animals and birds in National Parks	Except with respect to the Federal Territories of Kuala Lumpur and Labuan, agriculture and forestry.
4.	Civil and criminal law and procedure and the administration of justice.	Animal husbandry, prevention of cruelty to animals; veterinary services; animal quarantine.	Local government outside the Federal Territories of Kuala Lumpur and Labuan.
5.	Federal citizenship and naturalisation; aliens.	Town and country planning, except in the federal capital.	Except with respect to the Federal Territories of Kuala Lumpur and Labuan, other services of a local character.
6.	The machinery of government, subject to the State List.	Vagrancy and itinerant hawkers.	State works and water.
7.	Finance.	Public health, sanitation (excluding sanitation in the federal capital) and the prevention of diseases.	Machinery of the State Government, subject to the Federal List.
8.	Trade, commerce and industry.	Drainage and irrigation.	State holidays.
9.	Shipping, navigation and fisheries.	Rehabilitation of mining land and land which has suffered soil erosion.	Creation of offences in respect of any of the matters included in the State List or dealt with by State law, proof of State law and of thing done thereunder, and proof of any matter for purposes of State law.
10.	Communications and transport.	Fire safety measures and fire precautions in the construction and maintenance of building.	Inquiries for State purposes, including commissions of inquiry and collection of statistics with respect to any of the matters included in the State List or dealt with by State law.
11.	Federal works and power.	Personal law relating to marriage, divorce, guardianship, maintenance, adoption, legitimacy, family law, gifts or succession testate and intestate.	Indemnity in respect of any of the matters in the State List or dealt with by State law.
12.	Surveys, inquiries and research.	Adulteration of foodstuffs and other goods.	Turtles and riverine fishing.
13.	Education.	Shipping less than fifteen registered tons, including the carriage of passengers and goods by such shipping, maritime and estuarine fishing and fisheries.	Native law and custom, including the personal law relating to marriage, divorce, guardianship, maintenance, adoption, legitimacy, family law, gifts or succession testate or intestate.
14.	Medicine and health including sanitation in the federal capital.	The production, distribution and supply of water power and of electricity generated by water power.	Incorporation of authorities and other bodies set up by State law, if incorporated directly by State law, and regulation and winding up of corporations so created.

15.	Labour and social security.	Agricultural and forestry research, control of agricultural pests, and protection against such pests, prevention of plant diseases.	Ports and harbours, other than those declared to be federal by or under federal law.
16.	Welfare of the aborigines.	Charities and charitable trusts and institutions in the State (that is to say, operating wholly within, or created and operating in, the State) and their trustees, including the incorporation thereof and the regulation and winding-up of incorporated charities and charitable institutions in the State.	Cadastral land surveys.
17.	Professional occupations, other than as specified.	Theatres; cinemas; cinematograph films; places of public amusements.	Libraries, museums, ancient and historical monuments and records and archaeological sites and remains, other than those declared to be federal by or under federal law.
18.	Holidays other than State holidays.	Elections to the State Assembly held during the period of indirect elections.	In Sabah, the Sabah Railway.
19.	Unincorporated societies.	In Sabah until the end of the year 1970 (but not in Sarawak), medicine and health, including the matters specified in items 14 (a) to (d) of the Federal List.	
20.	Control of agricultural pests; protection against such pests; prevention of plant diseases.		
21.	Newspaper, publications, publishers, printing and printing presses.		
22.	Censorship.		
23.	theatres; cinemas; cinematograph films; places of public amusement.		
24.	Federal housing and improvement trusts.		
25.	Co-operative societies.		
25.	Prevention and extinguishment of fire, including fire services and fire brigades.		
26.	All matters relating to the Federal Territory Labuan, and the States of Sabah and Sarawak.		

Table 7: Federal, Concurrent and State Responsibilities in the Malaysian Government.
Source: Commonwealth Legal Information Institute (2018).

Based on the structure of the Malaysian government, the ministry is the highest agency in the federal government's administration. A ministry is headed by a Minister and Deputy Minister, who carry their own responsibilities, and as primary reference for a particular ministry and other agencies monitored by the ministry. This is one of the reasons for choosing a ministry to be the case studied in this research.

4.3 Vision 2020

In 1991, the Prime Minister of Malaysia, Tun Dr. Mahathir Mohamad, launched Vision 2020 (Khattab, 2004). Its goal was for Malaysia to become a developed country by the year 2020. "It should be a united nation, with a confident society, infused by strong moral and ethical values; a society that is democratic, liberal and tolerant, caring, economically just and equitable, progressive and prosperous, and in full possession of an economy that is competitive, dynamic, robust and resilient" (Mohamad, 1991, p1). However, Vision 2020 is not limited to the economic sphere; it covers all aspects of life, including the economic, political, social, spiritual, psychological and cultural areas. Vision 2020 has transformed Malaysia from a primarily rural nation into an urban country (Puteh, 2004).

4.4 Multimedia Super Corridor (MSC)

The idea behind the Multimedia Super Corridor (MSC) derives from former Prime Minister of Malaysia Tun Dr. Mahathir Mohamad's speech launching Vision 2020. The MSC was an initiative that was intended to support the development, by the government, of information and communication technology (ICT) in Malaysia (Injau, 2012).

The MSC project was shaped as a local version of Silicon Valley in the United States of America, and the physical area of the MSC was determined as being 15 km wide and 40 km long. In some of this area, known as Cyberjaya, Information Technology (IT) companies are allowed to develop their technology businesses with the help of the government's infrastructure, and some IT developers are allowed to buy some part of the land in Cyberjaya (Hamzah, 2004). The MSC features "advance logistical facilities and physical infrastructure including Putrajaya and Cyberjaya that are respectively the

future administrative and commercial hubs of the nation” (Raza Abidi et. al, 1998).

There are seven flagship projects under the MSC, which relates to electronic government; smart schools; research and development (R&D) clusters; multipurpose card; telemedicine; worldwide manufacturing, and web and borderless marketing (Raza Abidi et. al, 1998). “The objectives of the seven flagship projects are to ensure the development of the MSC, to increase competitiveness among nationals, to provide high value jobs and to reduce the digital divide of computer and internet access in Malaysia” (Ahmad and Othman, 2006, p2).

Communications technology is one of the essential components of e-government. It helps to support e-government, and offers advantages for public administration and the citizens of Malaysia, for example by improving efficiency, increasing levels of knowledge sharing among stakeholders through the use of supportive technologies, and reducing government expenditure (Ahmad and Othman, 2006).

The process of Malaysia’s transformation towards becoming a leader in the knowledge economy is expected to be achieved by the year 2020, in line with Visions 2020. There are three phases involved in the transformation. Malaysia is currently at Phase 3 of the development of the MSC, having passed through Phase 1 which is successfully create the MSC and Phase 2 which is growing MSC into a global ICT hub (Tiaz, 2012).

4.5 E-Government in Malaysia

E-government can be a cost-effective solution that improves communication between government agencies and citizens by providing access to information and services online (Chen et.al. 2006). Lowry (2012) stated that the strategy to improve e-government is by promoting data sharing within government departments. Based on a report by the IRMT for the implementation of e-government in Tanzania, one of the strategies of e-government is to develop systems for information sharing across the government, to break down information archives and eliminate the use of in-house systems (International Records Management Trust, 2011).

By 2007, the government Committee for Internet and Information Communication and Technology (Jawatankuasa IT Dan Internet Kerajaan - JTICT), chaired by Chief Secretary to the Government of Malaysia, announced the idea of the development of e-filing. In 2011 the JTICT decided to develop a Digital Document Management System (DDMS) to assist in e-filing and progress towards paperless government, and to implement it by 2014. The DDMS was piloted by the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) and disseminated in stages to government departments.

The vision of e-government is to deliver effective and efficient services to Malaysian citizens by becoming more responsive to their needs. For the seven flagship aims of the MSC, seven high-technology projects have been identified to be the core applications in the e-government initiative. These projects related to: the Human Resources Management Information System (HRMIS); e-Procurement; Generic Office Environment (GOE); Project Monitoring System (PMS); e-Services, Electronic Labor Exchange (ELX); and E-Syariah (Muhammad, 2013).

According to Chen et al. (2006), the implementation of e-government entails high costs in the preparation of telecommunications infrastructure. In Malaysia, e-government applications share the same network, which is EG*Net. This network is used to integrate and connect every application (MAMPU, 2010). Furthermore, it helps in data sharing among the existing systems such as the HRMIS. According to the Public Service Department (2015), the Malaysian Government has developed HRMIS data sharing using web services for integration among government agencies. It provides documents for guidance. One of the aims of e-government is to provide better communication between the federal and the state government.

4.6 Records Management in Malaysia

The history of record keeping and archiving in Malaysia began under the name of the Public Records Office on 1st December 1957, the year the country gained independence. Tuan Haji Mubin Sheppard was appointed as the Keeper of Public Records. By 1963, the name was changed to the Department of National Archives or the National Archives of Malaysia (National Archives of Malaysia, 2015). The establishment of the Public Records Office shows that an awareness of record keeping had been developed specifically for public records. A strategy for archiving the collection of significant documents related to events in Malaysia was developed. This aimed to ensure that such documents were safeguarded and could be used for future reference. In 1969, a complete list of records held by the National Archives of Acceptance List (1957-1967) was published (National Archives of Malaysia, 2015), demonstrating that records management had been practiced since independence.

The study of the history of handwritten documents and manuscripts in Malaysia or 'Tanah Melayu' had already started in the pre-colonial, colonial and post-colonial periods of British occupation. The Malaysian civil service was constituted during British colonial rule (Hussain, 1998). Public administration today still practices and values the manuals introduced by the British. According to Kratz (2009), there was evidence of British and Malay interest in handwritten documents since the discovery of an English-Malay dictionary, which was published in 1614. The dictionary had been published letter by letter and even in 'jawi'. Due to the influence of the British colony in Malay literature, some English letters were adopted in Malay handwriting.

Although the National Archives of Malaysia has been in existence for more than 50 years managing records in Malaysia, it is ironic to note that not many people know exactly what is the role of archives, the needs of managing and preserving records and archives according to the records management principles, and the professionals who are responsible in managing and preserving its (Ismail and Jamaludin, 2011).

The archival profession began with the establishment of the National Archives in 1957 and their role was regarded as a low professional profile in

the Malaysian Government, due to the nature of their work, which is unknown compared with other roles. The archival profession has limited contact with the government agencies who they served (Ismail and Jamaludin, 2011). Based on a letter from the Chief Secretary to the Government of Malaysia (2015), each government agency needed to form a records management section which should be monitored by a records manager from NAM.

Before the implementation of the DDMS, the Malaysian Government used a paper based record keeping system for business transactions, which included printed versions of electronic records. The records were stored in decentralised registries according to departments. Record keeping by the Malaysian Government started with the management of paper records. By early 2000, the Malaysian Government was still implementing a paper based record keeping system instead of electronic records. This was not unusual for Malaysia since, according to Hashim (2004), 91% of records management policies in local universities in Malaysia were related to paper record keeping compared with only 9% for electronic records.

The transition from paper to electronic records in Malaysia started when the Multimedia Super Corridor (MSC) was established in 1996; this is the first step towards electronic government (e-government) (Johare, 2001). Yusof and Chell (1998) explained that "Malaysian businesses should recognise that records management can make a significant difference to their ability to comply with the requirements of the ISO 9000 series of standards and enable them to fulfil the goals of Vision 2020".

The process of transition from paper to email started with the replacement of letters and memos with email. Emails have since then been formally used together with attachments and accepted as records. The National Archives of Malaysia (n.d), has stated that inward and outward email messages from the public and private sector are examples of electronic records created in the web environment. Moreover, with the formation of e-government, information relating to the development of policies for email has been received in the form of electronic records in the web environment (National Archives of Malaysia, 2010). Currently, the records keeping system used by the Government of Malaysia is a hybrid one. This has arisen since the implementation of the DDMS.

4.7 Electronic Records Management

The implementation of e-government has necessarily encouraged the development of electronic records in Malaysia. The awareness of managing electronic records among the government sector in Malaysia is reflected in the actions of found expression the Government of Malaysia who have published circular letters, policies and guidelines concerning management of electronic records, and instructed NAM and MAMPU to create an electronic record keeping system and a document management system.

According to National Archives of Malaysia (2015), the latest circular letter relating to electronic records management is Circular Letter No. 2 Year 2016: The Implementation of MS ISO 16175:2012 Information and Documentation: Principles and Functional Requirements for Records in Electronic Office Environments (Malaysian Government, 2016). In the circular letter, signed by Chief Secretary to the Government of Malaysia from the Prime Minister's Department, the public sector in Malaysia now uses many digital applications in implementing policies and presenting information to citizens. Some are document management and business system applications, neither of which fulfils the functional requirements for digital records. This has a negative impact on the management of records, which are thus not properly managed and organized (Chief Secretary to the Government of Malaysia, 2016). The Chief Secretary to the Government of Malaysia stated in the circular letter that the public sector should obtain advice regarding the implementation of the MS ISO 16175:2012 standards from NAM. Moreover, MS ISO 16175:2012 has been used by NAM since 2012 to ensure that records can be transferred to them and preserved by them.

The MS ISO 16175:2012 standard was also used by MAMPU in the development of the current Digital Document Management System (DDMS) that is used to store, locate, and index all electronic and paper records and to store them in electronic form (MAMPU, 2016b). According to the person in charge of developing the DDMS (Zain, 2016) in the Convention of Records Management 2016 from the National Archives of Malaysia, the establishment of the DDMS refers to three main documents: the National Archives of Malaysia Act 2003; the MS ISO 16175:2012 standard; and the Circular Letter No. 5 Year 2007: Guidelines for Office Management

(Malaysian Government, 2007). As stated in the Circular Letter, files in the public sector must be managed systematically according to records management standards, procedures and given file classification codes developed by NAM (Malaysian Government, 2007).

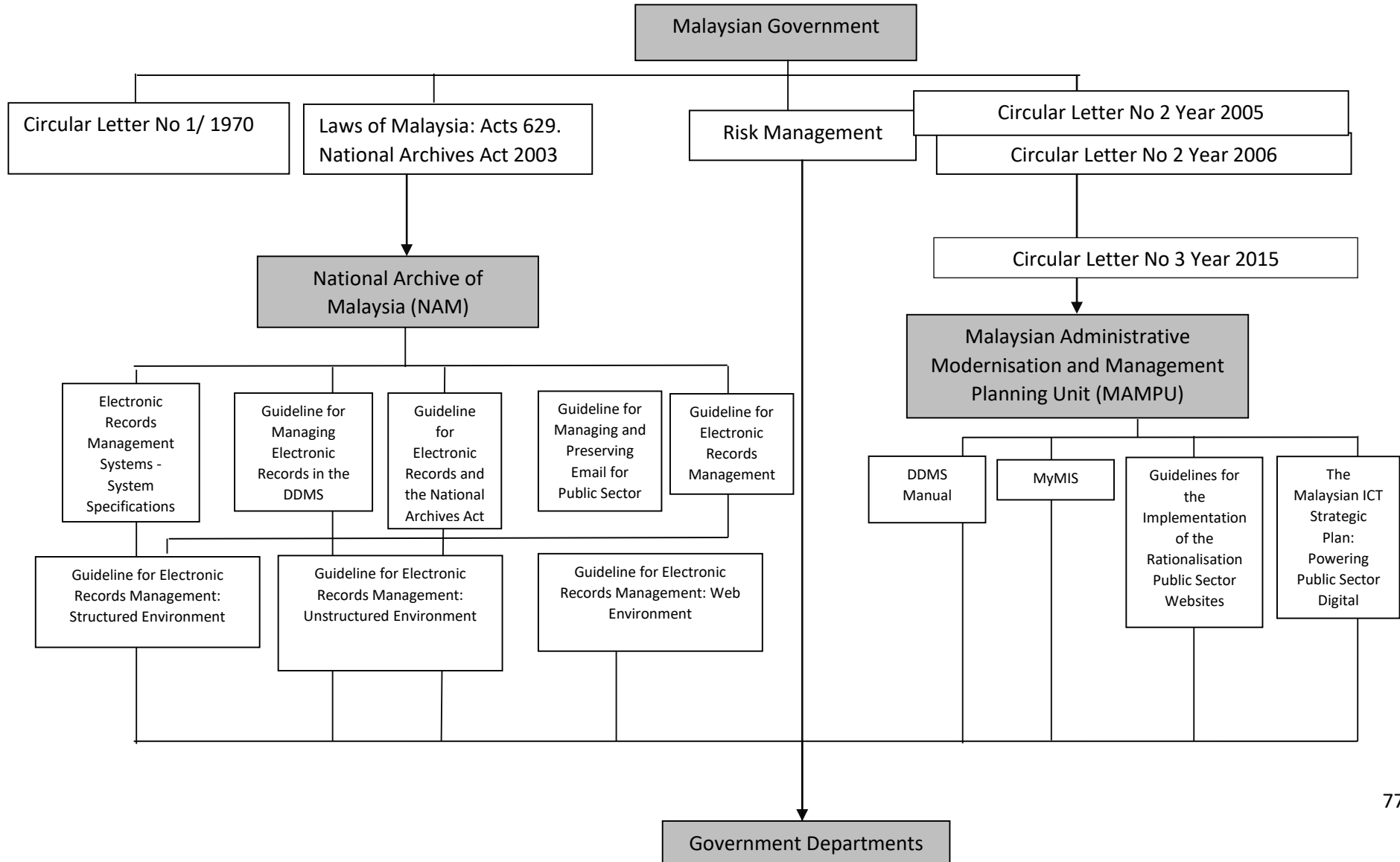
The collaboration between MAMPU and NAM while developing the DDMS system was based on the statement relating to file management in Section IV of the Circular Letter No. 5, Year 2007 (Malaysian Government, 2007). Here it was stated that “government departments and agencies need to consult and gain advice from the National Archives of Malaysia when developing a computerized application system to ensure that electronic records are created, maintained and disposed of according to appropriate archival standards” (Malaysian Government, 2007, p53).

4.8 Email Management Policies and Guidelines in the Malaysian Government

Policies and guidelines offer guidance to users in implementing official procedures. In the context of electronic records and email management in the Malaysian government, there are several sources of policies. The Prime Minister’s Department has given mandates to the National Archives of Malaysia (NAM) in the National Archives Act 2003, and to the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU) to provide guidelines for record keeping, and Information and Communication Technology (ICT) for government departments in Malaysia.

Figure 2 shows a total of 18 sets of guidelines relevant for email management in Malaysia. There are five major sets of guidelines which are relevant to email management in the context of record keeping published and monitored by the National Archives of Malaysia under the Malaysian law in Act 629 or the National Archives Act 2003. This Act is linked to the Circular Letter No 1/ 1970 (Malaysian Government, 1970) which is the proof of the mandate given by Prime Minister’s Department to the National Archives of Malaysia in organising records in any format in government departments.

Figure 2: Guidelines for Managing Electronic Records and Email in Malaysia



Document	Author	Publication Date	Purpose / Function
Circular Letter No 1/ 1970	Malaysian Government	1970	"The general circular is to ensure all government departments in Malaysia not only submit the unused record in the National Archive of Malaysia (NAM), but the government departments need to submit all the publications and reports a month after completed to the National Archive of Malaysia for better references. However, for reference limited types of reports, it will be opened only after obtaining permission from the government department and limited to the government servants only "(Malaysian Government, 1970).
Malaysian Public Sector Management of Information and the Communications Technology Security Handbook (MyMIS)	MAMPU	2002	"This handbook provides the necessary guidelines on ICT security management safeguards to enable implementation of minimal security measures. It discusses elements of management safeguard, common operational and technical issues, and legal implications" (MAMPU, 2002).
Laws of Malaysia : Acts 629. National Archives Act 2003	Parliament of Malaysia (Malaysian Government)	2003	"A mandate from Government of Malaysia to National Archive of Malaysia. An Act to provide for the creation, acquisition, custody, preservation, use and management of public archives and public records; and for other matters connected there with" (Parliament of Malaysia, 2003).
Guidelines For Electronic Records Management. More specific guidelines addressing the management of electronic records in specific environments are also available. These are as follows: Managing Electronic Records in the Unstructured Environment, Managing Electronic Records in the Structured Environment, and Managing Electronic Records in the Web Environment.	National Archives	2005	"This guideline contains five sections which Section 1 is provide an introduction of the guideline and Section 2 is an overview of the concepts and definitions that underpin the guidelines described in subsequent sections. Section 3 provides general guidance on the management of electronic records throughout their life cycle (i.e. creation, preservation, use, and disposition). Section 4 presents a checklist of management and governance considerations that should be addressed to ensure that a sustainable program for the management of electronic records is in place. Section 5 addresses specific topics such as the management of encrypted records" (National Archives of Malaysia, 2005).
Guidelines on Electronic Records Management: Managing Electronic Records in the Structured Environment	National Archives	2005	The purpose of this guideline is to provide Public offices with guidance on how electronic records can be managed in the structured environment. The guidance is designed for systems developers, database administrators, system support staff, records management staff and program managers responsible for business information systems. This guide should be used in conjunction with Guidelines on Electronic Records Management (National Archives of Malaysia, 2005).
Guidelines on Electronic Records Management: Managing Electronic Records in the Unstructured Environment	National Archives	2005	"The purpose of this guideline is to provide specific guidance on the management of electronic records generated in the 'unstructured' environment. This guide will be of particular interest to program managers and staff, LAN administrators, registry staff, and users of e-mail systems. This guide should be used in conjunction with Guidelines on Electronic Records Management and Electronic Records and the National Archive Act 2003" (National Archives of Malaysia, 2005).
Electronic Records and the National Archives Act 2003	National Archive	2005	"The guidelines and procedures described in this document are designed to enable public offices to comply with the National Archives Act 2003 and those legislative provisions requiring public offices not to dispose of their records (including electronic records) without the approval of the National Archivist and to transfer records assessed as having archival value to the control of the Arkib Negara Malaysia (NAM)" (National Archives of Malaysia, 2005).
Management Guidelines and Mail Care Electronic Public Sector	National Archive	2005	"The guidelines adopted by public officials to manage and maintaining official email. It includes e-mail, which officially opens received or generated by any civil servant in affairs official covering the entire life cycle of official email" (National Archives of Malaysia, 2005).

Circular Letter No.6 Year 2005	Malaysian Government	2005	"The contents of the letter is to inform all the government departments in Malaysia regarding a guideline which are intended to inform stakeholders and how to implement information security risk assessment in the public sector" (Malaysian Government, 2005).
Circular Letter No.2 Year 2006	Malaysian Government	2006	"This general circular is intended to explain the strengthening of the governance of Government IT and Internet Committee (JITIK) and sub-committees under it" (Malaysian Government, 2006).
Circular Letter No.1 Year 2009	Malaysian Government	2009	"This general circular is intended to replace the guidelines to the agencies Government to consult and obtain the approval of the technical terms for acquisition of information and communication technology (ICT) of the Committee ICT Technical (ICTTC) that deal faithfully in ABLE" (Malaysian Government, 2009).
Guideline for Managing and Preserving Email for Public Sector	National Archives	2010	"These guidelines used by public servants to manage open access types of email records. It is to manage email records based on life cycle model that received and sent in business processes" (National Archives of Malaysia, 2010).
The Malaysian ICT Strategic Plan: Powering Public Sector Digital Transformation 2011-2015	MAMPU	2011	"The document describes the strategic intent and direction of ICT including email in the Public Sector toward enabling pervasive use of ICT for citizen centric and whole of government service delivery in Malaysia" (National Archives of Malaysia, 2011).
Electronic Records Management Systems - System Specifications for Public Offices	National Archives	2013	"This document focuses on the creation and management of electronic records. It has been arranged with many headings and sub headings for ease of understanding and carries clear descriptions as outlined in the International Council on Archives, Principles and Functional Requirements for Records in Electronic Office Environments – Module 2: Guidelines and Functional Requirements for Electronic Records Management Systems, 2008. It is intended for use by the public and the private sector organizations that wish to introduce, develop and implement Electronic Records Management System, or to assess the Electronic Records Management System capability they currently have in place" (National Archives of Malaysia, 2013).
DDMS Manual	MAMPU	2014	This manual assists the government sector to use and manage electronic records in the DDMS (MAMPU, 2014).
Guidelines for Implementation of Public Sector Rationalisation Website	MAMPU	2015	"These Guidelines are intended to provide guidance to public sector agencies to carry out rationalization of public sector websites existing in the direction improving the effectiveness of government service delivery system molded citizens (citizen-centric)" (MAMPU, 2015).
Circular Letter No.3 Year 2015	Malaysian Government	2015	"This general circular is to provide guidance for public sector agencies to apply for approval of technical projects Information and Communication Technology (ICT) of the Public Sector ICT Technical Committee (JTISA) who deal faithfully in Administrative Modernisation and Management Planning Unit (MAMPU), Prime Minister (JPM) as well as monitoring the progress of the development and implementation of ICT projects" (Malaysian Government, 2015).
Guideline for Managing Electronic Records in the DDMS	National Archives	2016	"This guideline assists the government sector to manage electronic records in the DDMS according to the life cycle of records" (National Archives of Malaysia, 2016).

Table 8: Policies, Principles and Guidelines Relevant for Email Management in Malaysia

There are five major sets of guidelines used in managing email and electronic records, which are: the *Guidelines of Managing and Preserving Email for Public Sector*; *Managing Electronic Records in the DDMS* guideline; Guideline for Electronic Records and the National Archives Act 2003; *Electronic Records Management Systems - System Specifications for Public Offices*; and *Guidelines for Electronic Records Management*. However, in conjunction with the *Guidelines for Electronic Records Management*, there are three more sets of guidelines which are divided according to their specifications in the *Guidelines on Electronic Records Management* concerning the *Structured Environment*; *Unstructured Environment*; and the *Web Environment*.

In terms of Information and Communications Technology (ICT), the Government of Malaysia has given authority to MAMPU to monitor ICT use and provide guidelines to the Malaysian government. Both the Circular Letter Year 2006 (Malaysian Government, 2006) and the Circular Letter No 3 Year 2015 (Malaysian Government, 2015) act as proofs of MAMPU's responsibilities and functions.

There are four relevant sets of guidelines to this research which are provided by MAMPU, which are *MyMIS*; *the Guidelines for the Implementation of the Rationalisation Public Sector Websites*; and *the Malaysian ICT Strategic Plan: Powering Public Sector Digital Transformation 2011-2015*.

All of these guidelines are used in the Malaysian Government to ensure that the procedures used are more effective and better managed. Table 8 shows as a summary of policies, principles and guidelines relevant for email management in Malaysia. The policies, circulars and guidelines were developed from the Malaysian Government, NAM and MAMPU to manage electronic records in the government sector. The main guidelines used in managing email in the Malaysian Government are based on the implementation of the DDMS are: *National Archives Act 2003/ Act 629* (Malaysian Government 2003), *Guideline for Managing Electronic Records in the DDMS* (National Archives of Malaysia, 2016), and the *DDMS Manual* (MAMPU, 2014).

4.9 The Digital Document Management System (DDMS)

E-government in Malaysia involves both the federal and state government. However, in managing email in the government sector in Malaysia, the government has implemented the Digital Document Management System (DDMS) which currently focuses on the federal government only, although is soon to be implemented by state governments too. The implementation of the DDMS is intended to help enable paperless government services. Before the DDMS, the Malaysian government used a manual paper based record keeping system where all electronic records needed to be printed and stored in a file room. MAMPU developed a General Electronic Office (GEO) system in 2005 to manage electronic records. However, after examination by NAM, the system was deemed to have failed to comply with the international records management standard ISO 15489 (2001).

In line with the National Blue Ocean Strategy (NBOS), MAMPU spearheaded the development of the DDMS together with NAM, which has the most experience in records management. The DDMS is intended to be used to store, locate and index all electronic and paper records (MAMPU, 2016b). It has been developed by a vendor and monitored by MAMPU. The functional requirements of the DDMS were drawn up by NAM according to ISO16175:2 (2012), which is the international standard on the principles and functional requirements for records in electronic office environments. Currently, the DDMS provides an audit trail and a central repository for records, whereby all records and documents are available to users and can be shared. The DDMS was central to this research to explore current practices in managing email in the government sector. It is also protected by ICT security protocols (MAMPU, 2016b).

The DDMS uses a cloud based software-as-a-service delivery model, centrally hosted on a secure cloud platform and only accessible through the 1GovNet network. 1GovNet is the Government Integrated Telecommunications Network (GITN), which is managed centrally to support the delivery of public services and to provide a platform to enable access to all electronic government applications, including internal applications, and access to the Internet. 1GovNet is provided to ministries, departments and agencies of the Federal Government and Federal Statutory Bodies

(Government Integrated Telecommunications Network, 2015). The DDMS is integrated with 1GovUC by 1GovNet's support. 1GovUC is a part of the government cloud service system which is located in the Public Sector Data Centre using 1GovNet network services. It is a data sharing service managed centrally at MAMPU which combines the channels of email, audio and video conferencing, instant messaging, fax, short message services (SMS) and Identity Management System. In addition, the service also provides information sharing through the Collaborative and Public Information Portal 1GovUC (MAMPU, 2016a).

By using cloud computing technology, the DDMS can be accessed at all times via the internet and 31 ministries and agencies have been encouraged to adopt it. The number of users has now reached 20,188, which exceeds the target number of 20,000 users. By introducing a new version of the DDMS, this system is expected to be extended to the whole of the public sector by 2020 to ensure that government records are managed electronically in order to fulfil the objective of making the Malaysian Government paperless (MAMPU, 2016b).

The implementation of the DDMS throughout the federal government is based on the Circular No. 5 of 2007: Office of Management Guide (Malaysian Government, 2007) from Chief Secretary to the Government of Malaysia.

4.10 The Implementation of the DDMS in the Case Study Ministry

In 2014, a flood disaster, which affected one of the states in Malaysia called Kelantan, destroyed state government records. Malaysia experienced 39 natural disasters during the period 1968-2004 and 49 percent of all natural disasters are caused by excessive rains and flood events (Shaluf and Ahmadun, 2006). This was one of the drivers for implementing the DDMS by the Malaysian Government. Another factor contributing to the implementation of the DDMS was the need for a proper filing system, since Malaysia's loss of Batu Puteh Island to Singapore due to records loss (as mentioned by MAMPU2 interviewed in this study).

By 2011, the government's Internet and Information Technology committee chaired by Chief Secretary to the Government of Malaysia declared the

implementation of the DDMS to improve records management in Malaysia's public sector. According to MAMPU (2014), The DDMS focuses on standard procedures in managing records four sets of principles: the National Archives of Malaysia Act 2003 (Malaysian Government, 2003); the Circular No. 5 of 2007: Office of Management Guide (Malaysian Government, 2007); MS2223:2009: Information and Documentation Records Management Part 1: General (Department of Standards Malaysia, 2009); and MS 2223:2009: Information and Documentation Records Management Part 2: Guidelines (Department of Standards Malaysia, 2009). MS 2223:2009 are based on ISO 15489 (2001). The DDMS was developed to perform the functions of records management based on the MS ISO 16175-2 (2012) *Information and Documentation - Principles and Functional Requirements for Records in Electronic Office Environments Part 2 Guidelines and Functional Requirements for Digital Records Management Systems*. This is the Malaysian adoption of ISO 16175 (2010). The system is capable of managing electronic records throughout the in lifecycle from creation to disposal. The use of the system may ensure the maintenance of institutional memory in addition to creating standardisation in electronic records management across the public sector. According to Zain (2016), the DDMS development was decided based on a series of meetings held between 2007 and 2011 (Table 9). It was implemented in Malaysian Government departments in several stages starting in 2015.

No.	Meeting Name and Date	Decision Made
1.	Government IT and Internet Committee (JITIK) on November 23, 2007	The meeting noted that in accordance with the Cabinet decision of October 3, 2007, MAMPU had been asked to develop an Electronic File Management System.
2.	Government IT and Internet Committee (JITIK) on March 4, 2008	The meeting noted the results of the Workshop Team for the Electronic Management System, attended by representatives from 47 government agencies on 13 and 14 February 2008, which agreed to enter classified documents into the system.
3.	Government IT and Internet Committee (JITIK) on July 4, 2011	The committee has agreed to implement the Electronic Record Management System (ERMS) by the Digital Document Management System (DDMS) project under e-government.

Table 9: Decisions of the DDMS Development

DDMS Version 1.0 used by 31 government departments (during the time of data collection); they moved to Version 2.0 starting from October 2016. According to statistic from MAMPU, the number of the DDMS users reached 19,718 in May 2016.³ DDMS Version 1.0 only manages open public records. According a Records Officer interviewed in this study DDMS Version 2.0 has additional features, in particular the ability to handle classified records which will enable both open public and confidential records to be captured. The change to DDMS 2.0 was a rapid one being within one year of the initial deployment of the first version. According to a Records Officer interviewed in the study this change caused difficulties for users in a particular Ministry because they were still in a learning process in adopting the DDMS in their business processes.

A DDMS Manual (2014) was published by MAMPU with collaboration and advice on subject matter from NAM, however government departments can amend it in line with their own business processes and requirements. The number of types of records cited in the DDMS guidelines has been increased from 29 to 36 types used in the ministries. The main focus of the DDMS is to capture, create and retain electronic records in government departments in Malaysia. Its aim is to centralise electronic records management in government departments by using the same standard classification numbers and guidelines to be monitored by the same organisation (MAMPU and NAM).

4.11 The File Classification Scheme in the Malaysian Government

The component of the DDMS used to group records is called the file classification scheme as developed by NAM. File classification is a process of gathering records to a group (National Archives of Malaysia, 2009). The classification system was designed by NAM according to item 9.5.1 in the Malaysian Standard 2223-1:2009. This classification system is applicable for paper and electronic records which are gathered together according to a hierarchical scheme of functions, activities and transactions.

³ Data given by the RO during data collection in 2016 taken from MAMPU statistics

However, the history of file classification in the Malaysian government started in 1986, when MAMPU published the *Filing System Guidelines for Government Agencies in Malaysia* (MAMPU, 1986). This guideline was used to persuade government agencies to develop their own file classification schemes based on subject classification and coding. In 2003, NAM was given a legislative mandate to facilitate the management of records in any physical form and to acquire, preserve and make available those of archival value (Malaysian Government, 2003). As the lead department responsible for facilitating the government-wide management of electronic records for the public sector in Malaysia NAM has improved the filing system developed by MAMPU and introduced a block numeric system focusing on administrative records as follows:

- 100: Administration Records
- 200: Building and Asset Records
- 300: Facilities Records
- 400: Financial Records
- 500: Human Resource Records

This is based on Circular Number 5 Year 2007, Subject 7.4 (Malaysian Government, 2007). NAM was the first agency in Malaysia to use an electronic records management system, which was the TRIM Software, later known as HP Records Manager. Its named Classification Functional File is in line with ISO 15489 (Malaysia Standard MS 2223:2009) (Department of Standards Malaysia, 2009). In 2015, MAMPU and NAM merged their expertise to develop the DDMS which has the following Functional File classification scheme:

- 100: Administration
- 200: Land, Building and Infrastructure
- 300: Asset
- 400: Financial
- 500: Human Resources
- 600 functional records related to the functions and activities of ministries or agencies

By the middle of 2016, government agencies were slowly changing to the new version of the DDMS 2.0, which provides additional features. The file

classification scheme categorises entries in terms of function, activity, sub-activity and transaction, the hierarchy being explained as follows:

- 'Function' refers to the highest level (series), which consists of aggregations of files and may be referred to as a 'class' or 'category'
- 'Activity' refers to files, consisting of aggregations of individual records which may be referred to as 'folders' or 'containers' and may be subdivided into volumes.
- 'Sub-Activity' refers to the specific activities in the main activity.
- 'Transaction' refers to items which are in this thesis referred to as 'records'. These may be comprised of multiple components.

An example of a file classification number is shown in Figure 3.

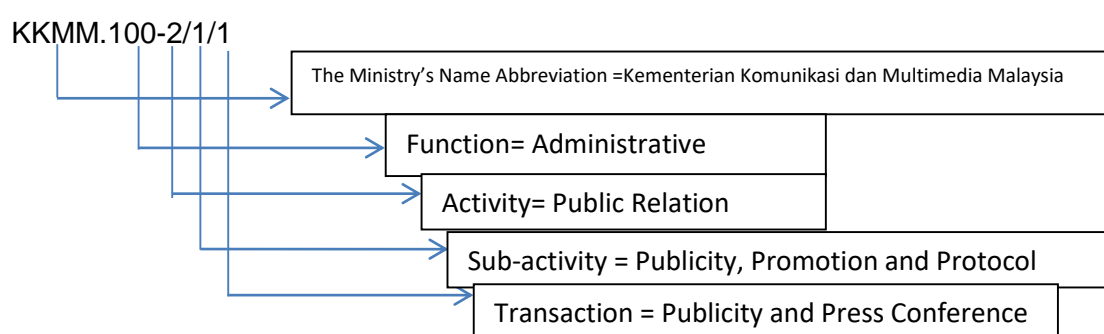


Figure 3: File Classification Scheme in the Malaysian Government
Source: Ministry of Communication and Multimedia. (2016)

As a former British colony some government organisations in Malaysia still retain the British registry format. The Selangor State Secretariat in Malaysia is an organisation that manages the administration of Selangor State in Malaysia. According to UNESCO (2014), the Selangor State Secretariat archives are believed to contain 302,334 files from between 1875 until 1953 and the records are classified systematically with file references representing the year of creation. These file titles comprise detailed and specific references to the content. The records also portray Malaya's relationship with other countries especially Britain and Commonwealth countries. It includes the transition of power from Britain to an independent Malaya.

4.12 Conclusion

In summary, record keeping in the Malaysian Government began when the country gained independence in 1957 and has continued to evolve with the transformation from paper to electronic records in the context of e-government implementation. As a former British colony, records and archives management were influenced by British national practices with the formation of the Public Record Office after independence. Since then, government records and archives have been managed by NAM. The transition to electronic records has involved MAMPU in developing and implementing the DDMS. The transition is not yet complete and a hybrid record keeping system is in use. The implementation of the DDMS, specifically as a record keeping system in the Malaysian Government, is discussed in the next chapter on the research findings.

CHAPTER FIVE

FINDINGS

5.1 Introduction

This chapter presents the findings from the interview sessions conducted with a Records officer (RO), three Persons in Charge (PIC) and three Operations Staff (OP) in each of the three departments (D1, D2 and D3) at the Ministry of Communication and Multimedia, Malaysia; two participants (NAM1 and NAM2) from the National Archives of Malaysia (NAM); and three participants (MAMPU1, MAMPU2 and MAMPU3) from the Malaysian Administrative Modernisation and Management Planning Unit (MAMPU).

The findings are based on the themes extracted from the coding stage of the data analysis. 184 themes, including 20 main themes and 65 sub themes, and another 99 were redundant themes resulted from coding. The findings found NAM and MAMPU were policies, guidelines and systems makers; whereas the Ministry staff were system user of email record keeping system in the Malaysian Government. The findings are structured in the thematic manner that emerged from the data.

5.2 Development of Policies and Guidelines

In the context of managing government records, both NAM and MAMPU act as the main bodies responsible for developing and implementing policies and guidelines. NAM is the main government department and subject expert in managing records and MAMPU is the leader in the modernisation of public administration systems in Malaysia (National Archives of Malaysia, 2016). Collaboration between NAM and MAMPU can be seen in the DDMS (Digital Document Management System). NAM is located in the Ministry of Tourism and Culture of Malaysia, which is led by a minister. MAMPU falls directly under the control of the Prime Minister's Department, which is a key central department that monitors and develops projects and resolves issues efficiently and effectively so that the implementation of policies, strategies, and programmes occurs in accordance with national development objectives.

One of the advantages of being located in the Prime Minister's Department is that MAMPU has a larger work force and financial budget compared with a government department in the Ministry, as can be seen in the case of the NAM:

"MAMPU is in The Prime Minister's Department. Three officers, three deputy officers and an assistant will conduct each project. In NAM, we (the Electronic Records Department) will conduct any project related to electronic records. If we have five projects, then we have to manage all five at one time using the same staff. So, this makes MAMPU more efficient in developing guidelines and conducting the projects" (NAM1).

The respective external environments of these organisations influence the process of the development of guidelines and policies and their implementation. However, the process for producing the policies and guidelines in MAMPU and NAM follows the same standards, by having an internal meeting involving the relevant team and then expanding the discussion to an external committee. This committee involves the Heads of all departments in MAMPU and NAM. As stated by the Director General of NAM in the *Managing Public Office Records* guideline:

"Records are intellectual property and institutional and national memories that are required by the Public Office. Records are evidence in administrative transactions. Thus, the record must be managed in an efficient, systematic and cost-effective way so that it can be accessed all the time" (National Archives of Malaysia, 2016 pg.2)

The policies and guidelines developed by NAM are based on current issues and perceived requirements (NAM3) and were developed so as to be used by government departments (NAM1). However, government departments may amend the guidelines depending on their specific needs. As MAMPU1 explained, one of the barriers facing MAMPU in implementing policies and guidelines is the lack of feedback from government agencies when they ask for comments on existing guidelines. The aim of the feedback is to ensure that the guidelines fit the needs and requirements of government agencies since they are the main users. MAMPU asked for feedback via email, however, the response was discouraging. The use of email as a mechanism to get feedback on the guidelines failed.

In terms of an overarching policy for the management of information in the Ministry, all three PICs said that there was no such policy. PIC1D1 said that:

“There are no specific Information Management (IM) Guidelines. However, this has been addressed in the *Circular of ICT Security*, Ministry of Communication and Multimedia Malaysia (2013). It mentions the management of open-access records [those accessible to any government agency employee] and classified records. This includes the privacy, security, digitisation and hard disc storage of records.”

An information management policy provides the authoritative overarching statement of the principles for managing information, including records, in accordance with best practice and to comply with information legislation (National Archives of United Kingdom, n.d). In contrast, there are policies and guidelines for the management of email in the public sector, covering creation, capture, organisation and disposal procedures, which have been developed and published by NAM and MAMPU. The procedures used in managing email records need to be documented for reference and “all the procedures need to have a Standard Operating Procedure (SOP)” (MAMPU2).

In the context of electronic records and archives management, before the National Archives Act 2003, there were guidelines for the creation of electronic records, for example the *Malaysian Public Sector Management of Information and Communication Technology Security Handbook Year 2002* published by MAMPU (2002). The chronology of accountability in developing policies and guidelines in the context of records management in Malaysia was explained by NAM1:

“since the National Archives Act 2003 was approved, NAM received a mandate from the Malaysian Government to handle and make decisions on records management, including of electronic records, in Malaysia.”

These two organisations play key roles in ensuring that record keeping in the Malaysian Government is undertaken systematically and that records have been uploaded to the DDMS to support the implementation of e-government. They are responsible for the governance of email. In this context the relationship between the organisations and their respective roles was specifically described by MAMPU1:

“NAM and MAMPU are categorised by their expertise. NAM is responsible as the owner of the Electronic Records Management System. It prepares and updates policies and procedures for managing electronic records based on technological change, creates

a General Circular Letter providing instructions for the use and implementation of the electronic records management system (ERMS), conducts studies on the impact of electronic record management (ERM) implementation in the public sector, [and] plans and implements ERM programmes in conjunction with MAMPU. As for MAMPU, we are responsible for planning and implementing the acquisition of an electronic records management system, planning and obtaining the financial allocation for the maintenance of the system, planning and implementing the security system and information/data security, [and] planning and implementing the use of the electronic records management system in the public sector in conjunction with NAM.”

NAM1 stated that the responsibility of NAM for electronic records management was “developing the policies and guidelines.” Their additional responsibility for updating them aims to ensure that they continue to be relevant and appropriate in the context of the dynamic technological environment and different formats.

Beside policies and guidelines, other relevant documents *National Archives Act 2003* (Malaysian Government, 2003); *Circular Services No. 5 Year 2007: Guidelines for Office Management* (Malaysian Government, 2007); *DDMS Manual* (MAMPU, 2014); and *Managing Public Office Records* (NAM, 2016) are disseminated to ensure that the public sector manages its records according to appropriate record keeping procedures. However, the process of developing these documents differs based on their nature and those involved, such as Ministry staff or Parliament/Cabinet.

MAMPU1 stated that:

“The principles are embodied at many levels. There are Acts, policies, guidelines, etc. The process to develop them takes different timespans. For instance, to develop an Act takes longer. The proposal needs to be discussed in Parliament. In terms of email management guidelines, the ministries and government agencies in the Malaysian Government have to wait for MAMPU to develop them. The ministries only publish guidelines related to their core business.”

Compliance with the guidelines from NAM is flexible; they can be adapted by the government agencies according to their specific requirements and environments:

“However, they have to follow NAM standards; for example, where to store the records etc. We produce broad guidelines. The guidelines produced by the agencies might adopt a different workflow as long as it complies with NAM’s policy.” (NAM1).

The guidelines managed by MAMPU (*Guidelines on Internet and Email Use in the Public Sector Year 2003*) were first introduced in 2003 to focus on the

use of the internet and email in the public sector. Previously, email was managed according to the agencies' own criteria, and currently the Malaysian Government is managing email using the 1GovUC server and the DDMS. However, the 1GovUC and the DDMS have only been implemented in the federal government, and MAMPU1 pointed out that:

“when both are well established then the implementation will proceed to the State level. Email is individual, by which is meant each individual has one [government] email account. Each agency has many email users and email accounts. Compliance with policies and guidelines is important to ensure that email management is efficient and effective based on individual efforts. The guidelines and SOP are published, but rely on users to comply with the principles or not.”

The practice in MAMPU is to use this accompanying letter to provide the latest information:

“There are rapid changes in managing email, especially in terms of email security. The Director of MAMPU is responsible for approving the accompanying letter that is used to update changes.” (MAMPU1).

Public servants can access circulars, policies and guidelines on the MAMPU website (<http://www.mampu.gov.my/en/circulars/category/81-general-circulars>). However, in NAM the practice in distributing information about their latest circulars, policies and guidelines is by informal notification to the agencies. As NAM1 explained:

“The policies and the guidelines are published on the NAM website. In the future, we would like to propose that the Policy Department disseminates the policies and guidelines we develop through circular letter emails to the government agencies. At this moment, there is no formal notification of the agencies regarding new policies or guidelines. We inform the agencies informally during consultations or in training programme.”

5.3 Implementation of Policies and Guidelines

5.3.1 Compliance with Email Principles in the Malaysian Government

Currently, the Ministry is using the *National Archives Act 2003* (Malaysian Government, 2003), *Electronic Records and National Archives Act 2003 Guidelines* (n.d); the *Electronic Records and Archives Management Policy* (n.d), *Electronic Records Management Guidelines* (n.d) , *Managing Public Office Records* (2016), *Retention Schedule for Public Office Records* (2014), and the *DDMS Manual* (MAMPU, 2014) to guide their management of records. With the exception of the Act and the *DDMS Manual* all of these

documents are published by NAM since it is mandated to be responsible for records and archives management in the public sector. However, as mentioned in Chapter 2, there is another set of guidelines for the management of electronic records in the Malaysian Government that was not mentioned by any of the participants during interviews. These guidelines include the *Procedure for Managing Electronic Records in the DDMS in Public Office's* (National Archives of Malaysia, 2013), *Guidelines on Email Management and Maintenance in the Public Sector* (National Archives of Malaysia, 2010) and *Guidelines on Internet and Email Use in the Government Sector* (MAMPU, 2003) and the *DDMS Manual for the Ministry of Communication and Multimedia Malaysia* (Ministry of Communication and Multimedia Malaysia, 2016). The Ministry staff were not aware of these guidelines even though their content can help to improve the Ministry's management of its electronic records, especially email. According to NAM3, guidelines for the management of paper and electronic records are prepared by NAM whilst MAMPU focuses on technical ICT management, including email management via the DDMS.

The implementation of email policies and guidelines among public servants was identified by three different stakeholders: NAM3, MAMPU1 and RO. NAM3 and MAMPU1 were in charge of the policy-making departments in NAM and MAMPU and RO was responsible for ensuring that the Ministry of Communication and Multimedia Malaysia complied with the email policies and guidelines.

However, the answers given by NAM3 and MAMPU1 are not specific to public servants in the Ministry of Communication and Multimedia, Malaysia. The answers apply to all public servants in the Malaysian Government. Only RO specified public servants in the Ministry. However, the responses relating to compliance with email policies and guidelines are based on the participants' perspectives as they were responsible for the policies and guidelines. These are summarised in Table 10.

Participant	Description
MAMPU1	Public servants in the Malaysian Government follow the email policies and guidelines given.
NAM3	Public servants in the Malaysian Government follow the email policies and guidelines given. However, they are more compliant with policies and guidelines for paper records. The policies and guidelines on electronic records are still at an early stage of implementation.
The Ministry	Some divisions in the Ministry of Communication and Multimedia Malaysia comply with the email policies and guidelines and some prefer to use their own methods to manage the email.

Table 10: Compliance with Email Policies and Guidelines

MAMPU1 stated:

“The government agencies follow the email policies and guidelines, since they are aware of the implications if they hesitate. In the Malaysian Government we have a star rating to evaluate the quality of agencies. The evaluation process occurs internally and externally. The internal evaluation is conducted by the Prime Minister’s Department and international evaluation done by [external] international bodies.”

The interviewee did not specify who these international bodies were. The government agencies have to maintain their performance level and ensure compliance since both affect the chances of the agency gaining a star rating that assists the agency in the allocation of annual budgets.

The government’s performance is significant in attracting international investors to invest in Malaysia, which helps to increase profitability and improve the standard of living in the country. Aspects such as ICT play a big role in advancing the Malaysian government’s international rankings, as MAMPU1 explained:

“Punitive action is used to monitor the governance of ICT in the Malaysian government. The punitive action used is the award of a star rating for an agency’s performance given by The Prime Minister’s Department. If the government is shown to be incapable of complying with governance criteria and associated principles, it will affect the country’s performance and governance quality. The international board will finalise the evaluation and, for example, the ODI ranking. It is important for the country to have a stable ICT infrastructure because it helps to attract international investors. This is how MAMPU sees its role in helping the government improve their ICT performance. In terms of governance, most agencies have followed the compliance programme. We have ISO standards as guidelines and a standards committee (led by the Chief Secretary to the Government of Malaysia) to endorse the policies and guidelines. It is important to know the authority for good governance. The documentation needs to be sent to the Dewan Bahasa Pustaka (DBP) (National Language Institution) to check the [Malay/English] language structure and the quality of the principles before it is published.”

There are no standard procedures to monitor the use of the policies and guidelines from either the developers (MAMPU and NAM) or the Ministry. How well they use the policies and the guidelines is not recorded. There is no standard procedure for monitoring and evaluating the use of email policies and guidelines in the Malaysian Government.

5.3.2 Barriers to Implementing the Policies and Guidelines in the Malaysian Government

Even though policies and guidelines have been developed for public servants to use, there are barriers to implementing them in the Malaysian Government. These barriers were described by MAMPU1:

“A policy takes 5 years to review. The process of reviewing takes some time and it is a complex procedure. There are a lot of policies that have not been reviewed and need to be repealed. One of the barriers is participation among the agencies. The MAMPU is responsible for developing principles for the agencies to implement. MAMPU needs feedback from the agencies to improve the guidelines but the feedback received is unsatisfactory. The agencies will implement the principles developed by MAMPU which is only responsible for planning and development, while the users are the agencies. The principles provide the methods for implementation. So, the agencies’ participation is very important. One of the methods we use is to create a first draft, placing it on the website to get the feedback from the agencies. However, there is lack of awareness among the agencies of this facility. There is no incentive to improve or understand the principles’ contents.”

It goes without saying that feedback from the agencies will help the developer to improve and revise the principles so that they can match the agencies’ requirements. The principles need to be appropriate, since this

helps their business processes, but limited feedback has been forthcoming which has negative consequences for implementation and compliance. Another barrier is in the context of implementation, as MAMPU1 explained:

“Even if there are policies and guidelines, the practicalities of implementation are still lacking. We intended to extend the duration of this introduction so that the agencies could try to implement the principles first, like a pilot study. If there is feedback to improve the principles, we will then finalise and endorse them. We selected big agencies for the pilot study, usually under the Prime Minister’s Department or a state agency, even though it is difficult for them to participate. The numbers of e-participants needs to be increased to support implementation [because] the policies and guidelines were inappropriate for the users even though they had been endorsed [by the Malaysian Government].”

Unfortunately, this statement seems to contradict the previous perspective of MAMPU1 on email policies and guidelines among public servants in the Malaysian Government.

Besides these two barriers, another barrier encountered during the development of the policies and guidelines was the lack of awareness among the agencies. This is supported by NAM1:

“The barrier is awareness. The ROs play a role in raising record keeping awareness with public servants in the ministries. However, the ROs in the ministries keep being relocated before their tasks are complete. This has limited the ministries receiving knowledge of records keeping. This occurred when agencies did not appreciate the significance of records management. Currently, the government is assigning ROs to the ministries. The importance of records management is acknowledged with the involvement of the cadre [i.e. ROs]. A huge number of ROs that were transferred to various agencies received AKNC (Quality Achievement Awards). That shows the government promoted the value of the ROs and records management. An RO is an individual who is responsible for managing records at the centralised registry and is a record keeping advisor to the ministries. Records management is more efficient since the presence of ROs in the ministries. The struggle we have is to ensure that records management is a priority and part of office management. It is a long cycle. Previously, it took 10 years to assign RO positions in the ministries. Now, by implementing the DDMS, it is significant for the agency to have an RO that has knowledge of records management. The DDMS and a proper record keeping system are the main keys to e-government implementation.”

An RO is a NAM staff member that has been assigned to a ministry in order to help them to manage their implementation of both the centralised registry and the DDMS. The RO is responsible for helping the Malaysian Government to raise awareness of records management among public

servants. Such awareness can be created by emphasising the importance of the record keeping system in the office environment.

5.4 Record Keeping Systems in the Ministry of Communication and Multimedia Malaysia

The term record keeping system has been formally acknowledged since the development of the centralised registry and the DDMS. The record keeping system at the Ministry of Communication and Multimedia has changed from being purely decentralised registries, categorised by section and department, to a combination of both centralised and decentralised registries. The centralised registry started on the same date as the DDMS was launched, on 22nd June 2015. The change was a direct result of the DDMS implementation.

The hybrid record keeping system consists of paper records in the centralised registry, the records in the DDMS system which share the same classification file numbers, and the continuing decentralised paper registries. The decentralised registries are also known as file rooms, one for each department or division and are used to manage and store classified records. During data collection in the Ministry, the term decentralised registry in fact meant a file room used to store the physical files for each section or department. The centralised registry is used to manage paper records that have been printed out from the DDMS, and the decentralised registries are used to manage classified records for use in specific departments or sections. PIC1D1 stated,

“Former practice is, this department is relying on a department registry (decentralised registry) to capture, create, manage, document and record the paper based records. We need the registry to provide the file, file number, and attachment number. All information regarding documents needs to request from the decentralised registry. It will take the longest time to produce one document. However, the procedure became easier since the implementation of electronic records and the DDMS. The information is generated automatically like how many records have been captured in a file, and the attachment number has generated automatically from the system. It increases our efficiency level. The records have been captured in the DDMS need to print and file in a physical file in a centralised registry as a backup if there is a technical error to the DDMS.”

However, the centralised registry is only for open-access records, since the DDMS is only fit for these access records. On the DDMS launch date, all Ministry staff were provided with the *DDMS Manual* (MAMPU, 2014) as guidance for its use. A year later the guidelines for *Managing Public Office Records* (National Archives of Malaysia, 2016), which combine the pre-existing guidelines specifically for managing paper records in the Ministry, were published.

The RO described the current system as follows:

“The record keeping system in the Ministry is a hybrid system. Paper records have not been abandoned even [though] there is an electronic record. Both paper and electronic instantiations are synchronised by sharing the same file number in the classification scheme. The physical file in the centralised registry is the representation of the email records in the DDMS. Previously, we managed paper records, but at this moment both run together. Emails need to be printed and filed in a physical file in the centralised registry or decentralised registries [sic] to ensure the connection between electronic and paper records. There is a cross-reference for files opened before the DDMS implementation. The cross-reference is made by adding the previous file name to the current file. The process is completed by the RA [the Record Assistant for the Department or Section]. The RA is responsible for doing the cross-reference since he/she is more familiar with the department or section’s business functions.”

As mentioned by the RO, the practice of managing emails in the Ministry is to capture them in the DDMS before being printed out and filed in the centralised registry and decentralised registries. However, emails that have been printed and filed in the decentralised registries are only for the particular department or section’s use, and that is not the responsibility of the RO or the centralised registry team to manage since the job scope is given by the Ministry. RO stated that:

“Records assistance is playing the roles to ensure the records in the decentralised registry are managed accordingly. I am only responsible in helping them not monitoring and managing the decentralised registry.”

According to PIC1D2, the hybrid centralised record keeping system means that the first page of an electronic record, such as an email and attachment, is printed and kept in the paper file located in the hybrid centralised registry. The advice given is to print only the first page in order to reduce file size; this was confirmed by PIC1D1.

However, the decentralised registries have some issues concerning inconsistency. The files in the decentralised registries are not being named according to the NAM guidelines in *Managing Public Office Records* (National Archives of Malaysia, 2016) and some are using glue to stick paper onto the file cover. PIC1D1 stated that

"maybe each unit [in the Ministry] has their own methods, some of them are using manual (paper records), some are not."

The centralised registry is limited to open records, which are those that can be accessed by all employees at the Ministry, whereas records with confidential status are still stored in the decentralised registries because space in the centralised registry room is limited. This is being reconsidered.

According to PIC1D2, the hybrid system is less user-friendly for new officers, such as PIC1D2, when searching for records. PIC1D2 also mentioned that the implementation of the DDMS means that documents and records are difficult to locate. PIC1D2's preference for paper based records influences attitudes to the implementation of the DDMS for email record keeping. PIC1D2 is mostly assigned task to Operation Staff to complete the capture of records in the DDMS and to file them in the centralised registry. But PIC1D2 is reluctant to use the DDMS.

However, in the context of record keeping systems, MAMPU1 believes a decentralised system is more costly than a centralised system:

"In system development, decentralised system is more costly than centralised. We did propose Royal Malaysia Police Department, Fire and Rescue Department, and other government agencies to centralised data centre system. Unfortunately, it is unsuccessful due to security reason. Data centre system is a very complex system. 99.9% need to be perfect and has a backup. For example, if one state data centre system is down, they will have a backup from other state. Same goes to other government agencies (MAMPU1)."

Even the decentralised information system is costly, but due to security issues it needs to retain decentralised. An information system needs to retain as decentralised due to security issues since it involves many government ministries, departments and agencies.

Thus, the integration the whole data system as centralised repository for the government agencies in Malaysia is a great challenge to MAMPU and the Malaysian Government.

5.4.1 Centralised and Decentralised Registries

The centralised registry in the Ministry is located in the Management Department and is governed by the Records Management Unit. It is used to manage open-access records, which are records that can be accessed by any employee in the government agencies that have been captured in the DDMS. These records are printed and filed there:

“Currently, the records stored in the centralised registry are open-access records since the introduction of the DDMS 1.0 which only manages open-access records. However, DDMS 2.0 will include classified confidential records. I prefer the current practices where the classified records are managed in each department or division file room. The responsibility for managing classified records is burdensome, especially if records are lost” (RO).

“Here (in the department mail room) we only store classified records” (OP2D2).

The decentralised registries are secure because only selected people (the RA for the department/division) can access the room (OP1D3). Even though the RO is responsible for the Records Management Unit, and for giving the Ministry advice on records management according to NAM guidelines (see section 5.3.1), their authority only applies to the Ministry’s open-access records.

The RO is therefore not allowed to access the decentralised registries which are used to store the departments’ classified records, unless accompanied by the RA for the specific department. RO said:

“The transition process from physical to the DDMS is started from zero. Mail received on the first day we captured in the DDMS. The mail and records before the DDMS implementation are kept in the unit or department mail room (decentralised registry). The problem occurred when the records are not found in the decentralised registry. This is giving a problem in mapping process. Mapping process is a linking process between physical records before the DDMS implementation with current records in the DDMS implementation by using a cross reference.”

The transition process of record keeping in the Ministry shows that a record keeping should be implemented to ensure records in the Ministry are kept

according to records management principles to retain their value as evidence.

5.4.2 The DDMS

5.4.2.1 The DDMS as a Record Keeping System

In the Ministry of Communication and Multimedia Malaysia, the DDMS has been implemented to manage electronic records, and specifically email records. Since the DDMS was launched in this Ministry on 22nd June 2015, 18,337 records had been captured, in just less than one year, by 31st May 2016. The DDMS complies with MS ISO 16175-2 (2012) *Information and Documentation: Principles and Functional Requirements for Records in Electronic Office Environments and Part 2: Guidelines and Functional Requirements for Digital Records Management Systems*, as required by MAMPU (2016). MAMPU1 shared that:

“[The DDMS] has been distributed to the agencies and each agency has the DDMS to manage their electronic records. Telecom Malaysia [a government-linked telecommunications company known as TM] is responsible as a 1GovUC [a collaboratively integrated communication service managed centrally by MAMPU] provider that helps to provide telecommunications to support the system. However, whether or not to use the DDMS depends on the government agencies. Enforcement depends on them and the government agencies’ top management. MAMPU actively raises awareness of the DDMS and electronic record keeping such as e-archiving. Currently, we are at the stage of digital government, which means that MAMPU needs to play a role in assisting the government in improving ICT.”

The DDMS has a big role to play in managing open-access records in the public sector. MAMPU1 shared that:

“Previously, email has not been captured even though messages are accepted as records and need to be used in business transactions. For that, every email needs to have a system link so that the flow inward and outward will be notified. We developed the DDMS to integrate with the email system so it can capture emails as records. It is an archive to store the email records and [it] supports any format of electronic records. The user needs to have an account to maintain the DDMS. The DDMS allows users to capture and record email according to the file classification scheme.”

The employees at the specific government agencies who have registered for a DDMS account have access to open records. Interviewees in the Ministry had different perspectives on the DDMS. For example, PIC1D1 (Head of the Security Unit) was positive about it, saying that:

“The DDMS is more organised, more formal compared with the email system. It improves efficiency. Electronic records are easier compared

to paper records. We can search for the file by using the file title and reference number."

PIC1D1's background and responsibility made them comfortable using electronic records. PIC1D1 felt the DDMS is a record keeping system that helps in managing the Ministry's electronic records.

The RO in the same department, not surprisingly perhaps, shared this view. However, the system had been implemented very quickly and the RO needed to understand the DDMS and the file classification scheme immediately in order to be able to assist employees in the Ministry in using it:

"It happened very quickly. I just joined the Ministry and I had to run the DDMS. I had to learn more about the DDMS from MAMPU and the file classification scheme from NAM" (RO).

Insufficient time to learn, prepare and be trained before being responsible for helping others in the Ministry to implement the DDMS are things that need to be considered by MAMPU and NAM as part of the management of change.

The main purpose of the DDMS is to support paperless electronic government, but it also helps in storing, tracking, and indexing paper documents. Hence, it can assist hybrid record keeping practices as is evident in the Ministry from the interviews:

"The contents of both electronic and paper records files need to be completed and reflect each other so that the paper file can be used as a copy to continue the task if the DDMS cannot be used." (OP2D1).

However, even though the function of the DDMS is to assist the government sector in managing electronic records in their business processes, the system has still not been fully implemented within the departments in the Ministry. One of the reasons for this is that users are reluctant to use it because they have the perception that the DDMS is just a system. They are not seeing it as a record keeping system.

Perhaps an awareness of the positive impact of the record keeping system on the management of the Ministry's records could change their perception. Users who were not yet supporting the implementation of the DDMS could not see the relevance for them of capturing records in the DDMS. One of the respondents felt that the procedure for capturing records in the DDMS and

then printing and filing them in the centralised registry was a burden. OP1D2 stated "It is better to send hard-copy as well even if the officer uses the DDMS.

5.4.2.2 The DDMS as a Tracking and Audit Trail System

As a record keeping system, the DDMS is designed to track records in the system. The function of the DDMS as an audit trail pertains to the functional requirements in ISO 16175:2 (2012) concerning information management systems to maintain the authenticity and reliability of records, which includes requirements for access and security (MAMPU, 2014).

"The DDMS is a system that provides an audit trail which assists in tracking the records" (RO). OP1D2, the only person to use the DDMS in Department 2 (D2), found it helpful in tracing file movements, and OP2D1 used it "to identify the individuals who accessed the records, how many times the records have been viewed and the movement of the file." As the departments' Records Assistants, their positions probably influenced their perception. However, others whose role was not specifically related to managing records also referred to the DDMS as a tracking system. For example, PIC1D1 said that:

"The DDMS has an audit trail of when we captured the records in the system; it provides a log, such as who is capturing the record. It is able to check the validity of the user. It is integrated with the email system to provide a transaction log. It includes information like the time and date the email was sent and it provides confirmation to the recipient if they have already received the email or not. There are a few factors that can be used to ensure that the email records are evidence and authentic in government communication and business processes, including the transaction log."

Meanwhile OP1D1 stated that the DDMS can also be "used to trace the movement of the records by using the records number or reference number." Even though the DDMS is successful as a tracking system, only Department 1 (D1) fully implemented it. PIC1D2 recognised its function as a tracking system, but still hesitated to use it:

"The process of tracking records is based on the reference number included in the DDMS. If there is [need for] a new file [this in practice is a folder], we need to inform the RO and ask them to create a new one for us. The record tracking is a must as a tool to provide evidence in a business transaction."

Based on the DDMS access matrix (see Table 11 in section 5.4.2.3), only the RO is allowed to create a new file in the DDMS for the Ministry. However, in the context of this Ministry, another option besides the RO is the RO's assistant. This is only allowed if the RO is not available and the matter is urgent.

According to MAMPU (2016), users of the DDMS are allowed to access, search for, download, add and route specific files to another user for further actions. Every action taken with records by any user will be recorded in the DDMS audit trail subsystem. MAMPU2 said that the DDMS helps in organising and tracing records efficiently compared with paper records where more time is needed. In controlling the authenticity and integrity of the data in the DDMS, the task of managing the system's contents is restricted by the level of responsibility of the staff involved. The RO explained that:

“The DDMS has an audit trail. Records that have been captured in the DDMS cannot be altered even by me as a Records Officer and in charge for the system. I'm only allowed to remove, delete or create a new record in the system. As for other users, they can only view what they have in the DDMS. I have to ensure that the records in the DDMS follow the correct formatting and the file classification number. In this Ministry, only two people are allowed to delete file in the DDMS - me and my assistant [RO and OP2D1/Assistant in Records Management Unit in Department 1]. But he can only delete the file when I'm on leave. This needs to be controlled to avoid unauthorised activity with the records, for instance alteration, in the DDMS. The DDMS as a tracking system and an audit trail can recognise any changes, duplication or loss in the file.”

Issues arose during the early stages of the implementation of the DDMS when employees wrongly captured records and wrongly added metadata in the DDMS. So the RO had to delete the incorrect records to ensure that the content of the records was accurate, in the sense of being the same as the physical copy filed in the centralised registry. Lack of training and insufficient time for preparation before the implementation of the DDMS could be reasons for these issues. However, the DDMS can still track records that have been created by a user who has retired or moved to another Ministry. MAMPU2 stated that:

“Once a user has stopped working in the agency, we will stop the email account. However, if the user has a DDMS account, the records captured in the system are still maintained and can be accessed by responsible staff who manages the DDMS. All the files captured in the DDMS can be referred to and used as an audit trail.”

This is standard practice in many organisations. There is a risk of unauthorised activity to the records in the DDMS, and it is therefore important for the RO and RA to have high integrity in being responsible for deleting records. Therefore, issues concerning data protection and the DDMS records need to be discussed.

In addition to the DDMS, the Ministry also uses the centralised registry as a tracking system and a back-up for the DDMS audit trail if there is a technical problem. The centralised registry uses a log book as a tracking system to record inward and outward files in the centralised registry. The Ministry uses this log book for their own benefit, as a result of some previous issues. For instance, there was an incident when a staff member forgot to file a printed email in a registry. However, they claimed they and a registry staff member had used the register (log book) as evidence. OP1D2 explained that “Yes, the log book was used to trace the file movement and to avoid the loss of records. It is one of the methods to preserve the records, so the records can be accessed all the time.” In Department 2, OP1D2 used their own initiative to create another record tracking system to record the movement of files in the department whether in and out of the department’s decentralised registry or the centralised registry. The latter duplicates the information already in the centralised tracking system. OP2D3 stated that, “We do have a decentralised registry and use a log book as a tracking system. There is information provided in the log book to show who has viewed and accessed the file in the decentralised registry. It is easy to trace.”

The RO also said that registers come in a variety of formats:

“There is a log book used for tracking in a centralised registry, and a system for inward and outward correspondence (letter) records so that we are not only relying on the DDMS. We may detect who took the documents and the attachments. This is an internal system that was developed by the Information Management (IM) division before the DDMS and it now acts as a back-up for the DDMS. This system is customised according to the Ministry’s requirements.”

This internal system fulfils the Ministry’s requirements because the Information Management Division knows the business needs of the Ministry’s employees. It is still being used even though the DDMS is operating. This is perhaps because Ministry staff are still not confident about

the reliability of the DDMS as a record keeping system to support their business activities.

In addition to these registers, some staff have their own individual tracking systems as evidenced by OP1D2, a Records Assistant, who said that: “I have created an electronic record keeping system using Microsoft Excel. It is easy to refer to. But I’m only creating it for confidential records for this department since I’m in charge of this department’s mail room.” The use of this Excel system and the internal system developed by IM division duplicate the functions of the DDMS and are probably being used for purposes of business continuity. The timespans of duplicate systems being used in the Ministry are undefined, but they may be used until the staff are fully compliant with and fully trust the DDMS as a record keeping system.

5.4.2.3 Use of the DDMS

The DDMS is used to assist the Ministry in records keeping activities that involve many processes. The DDMS processes involve capturing, searching for and retrieving documents and records in the system. The Ministry provides training on how to use the DDMS so as to improve the skills and efficiency of staff in handling it. The training includes one-to-one training and briefs from the RO: “I’m giving them personal training one-to-one, especially to senior staff, for a better understanding” (RO). In order to use the DDMS, staff need to be familiar with and understand their level of access and the associated responsibilities. An access matrix is provided in the *DDMS Manual* to inform users of this, as shown in Table 11.

No	Module – Sub module	SA	RM	EU	IW	AT
1	Setting and Download					
1.1	User Preferences	✓	✓	✓	✓	✓
1.2	Change Password	✓	✓	✓	✓	✓
1.3	View Details	✓	✓	✓	✓	✓
1.4	Download	✓	✓	✓	✓	✓
2	Setup & Configuration					
2.1	Classification	-	✓	-	-	✓
2.2	Record Type	-	-	-	-	✓
2.3	Retention	-	✓	-	-	✓
2.4	Batch Upload	-	-	-	-	✓
3	Create	✓	✓	✓	✓	-
4	Maintain					
4.1	Disposition Job	-	✓	-	-	✓
4.2	Hold	-	✓	-	-	-
4.3	Notification	-	-	-	-	✓
5	Disseminate					
5.1	Browse by Classification	✓	✓	✓	✓	✓
5.2	Principal	-	✓	✓	✓	✓
5.3	Advance Search	✓	✓	✓	✓	✓
5.4	Saved Search	✓	✓	✓	✓	✓
5.5	Favourites	✓	✓	✓	✓	✓
5.6	Recent Record	✓	✓	✓	✓	✓
6	Administer					
6.1	User Defined Field	-	-	-	-	✓
6.2	Principal	✓	-	-	-	-
6.3	User Profile	-	-	-	-	✓
6.4	Security Level	✓	-	-	-	✓
6.5	Login & Security Policy	-	-	-	-	✓
6.6	Session Tracking	✓	-	-	-	-
6.7	Report	✓	-	-	-	-

Table 11: Access Matrix in the DDMS
Source: *DDMS Manual* (MAMPU, 2014)

This shows that there are five types of people who can access the DDMS. They are the RM (records manager) also known as the RO, the SA (system administrator), the IW (information worker) also known as the RO's assistant, and the EUs (end users) who are the rest of the Ministry staff who use the DDMS. There are two types of SA; the first is in the Information Management Division and the second is a staff member from each department since they are more familiar with the business functions in the department. Only these four types of people are represented in the Ministry. The AT (application team) is from MAMPU.

Even though this access matrix has been provided, the tasks associated with each of these roles do not seem to have been synchronised with their workload. For example, from the interviews, the RO seemed to have authority for all of the modules, including the administrative one, even though the matrix does not assign this module to them. There is a lack of governance of access levels in the DDMS to monitor practice as compared to the principles laid out in the *DDMS Manual* (MAMPU, 2014).

5.5 Implementation of the DDMS in the Government Sector and the Ministry of Communication and Multimedia Malaysia

5.5.1 The DDMS in the Government Sector

As mentioned in Chapter 4, the government structures in Malaysia are categorised into federal and state government. The DDMS implementation is implemented in Federal Government. A Ministry is the highest agency in the federal government's administration. A Ministry acts to give guidance, or is the first reference point and platform, for other agencies. According to both MAMPU and NAM, the implementation of the DDMS in the government sector is at an early stage:

“The DDMS is still at the implementation stage and there is not 100% implementation in all government sectors. There is no mandatory requirement or enforcement to use the DDMS. There is no punitive action for those who do not use the DDMS. The reason [for limited uptake] is the lack of awareness of the system. Yet, there are government agencies which are reluctant to implement the DDMS and, since there is no punitive action taken, the choice belongs to the agency. The use of the DDMS is still only at the federal government level and we are planning to implement it at the state government level” (MAMPU1).

“The DDMS started from the Electronic Records Management System (ERMS) initiative by MAMPU in 2010. However, [government budget] meeting decided that there was an insufficient budget to develop and implement the ERMS. In 2011, MAMPU asked for a budget allocation for paperless government and decided to develop and implement the DDMS. The DDMS is an initiative from the National Key Economic Areas (NKEA) project [NKEA is defined as an important driver of economic activities that potentially and directly contribute towards Malaysian economic growth measurable in terms of the National Gross Income (NGI) indicator. The twelve NKEAs are the core of the Economic Transformation Programme (ETP) and one of them is NKEA for Communications, Content and Infrastructure] MAMPU controlled the budget to develop the DDMS and asked for NAM’s advice as a subject matter expert. MAMPU was reluctant to use the Hewlett Packard Records Management (HPRM) software since it was costly. The DDMS was designed from scratch, and by 2014 it had been fully developed. Two agencies, the Performance Management and Delivery Unit (PEMANDU) [a unit under the Prime Minister’s Department whose role is to oversee the implementation, assess the progress, facilitate as well as support the delivery and drive the progress of the Government Transformation Programme (GTP) and the Economic Transformation Programme (ETP)] and MAMPU piloted the use of the DDMS. DDMS 1.0 does not belong to the government. It is the [intellectual] property of a privately funded initiative [private vendor]. This is risky since the software belongs to the company. MAMPU decided to buy the system from the company but it put a high price on it. After calculating the cost, MAMPU decided to develop a new DDMS 2.0 and to migrate data from DDMS 1.0 to DDMS 2.0. The numbers of agencies that use the DDMS is currently 33. Yet, there are many requests from agencies to implement it to manage their electronic records” (NAM1).

The implementation of the DDMS in the government sector comes with the endorsement of the Malaysian Government but lacks the support of top management in the Ministries. Even though the system has been developed, enforcement of its implementation from top to lower management in the agencies is not in place. Whilst the DDMS is one of the Malaysian Government’s projects aiming to improve record keeping in the ministries, not all staff accept the new technology. The preference for paper rather than electronic records is hampering its implementation and adoption by public servants. The RO agreed that the DDMS is a good record keeping system that can help in the management of government records. The PICs’ perspectives relied on their exposure to the DDMS and their work responsibilities. Interestingly, PIC3D3 from Department 3, which has not implemented the DDMS because of the types of records it holds, sees the DDMS as a system that supports electronic government and that is needed in the Ministry.

5.5.2 The DDMS in Ministry Department 1

Department 1 (D1) is the largest department in the Ministry and has six divisions. Its function is to manage, and conduct planning for the Ministry, including administrative tasks. Staff from the department's Information Management Division and Records Management Unit were interviewed for this study. The Records Management Unit is responsible for the DDMS and the centralised registry. The Information Management Division is responsible for preserving the integrity of electronic data, promoting the sharing of information and providing measures for the electronic dissemination of information. This division leads the implementation of ICT programmes for the Ministry.

Interviews were conducted with the Records Officer (RO), a PIC and two operational staff, one of whom, OP2, was the Record Assistant for the RO in the Records Management Unit. The PIC had responsibility for the security of ICT and the information system in the Ministry.

This Department had the highest percentage of DDMS users in the Ministry. It fully complies with the *DDMS Manual* (MAMPU, 2014) and the guidelines for *Managing Public Office Records* (National Archives of Malaysia, 2016), because it includes two divisions with responsibility for managing information more generally and the centralised registry and the DDMS more specifically.

The RO persuaded staff to use the DDMS and the file classification scheme provided by NAM. PIC1D1, OP1D1 and OP2D1 were all using the DDMS to capture their email records (Table 12). They used it as an audit trail and to ensure that records were captured by the system and stored in the repository. As for paper based records, this department complied with the guidelines by printing out the records and filing them according to the file classification scheme.

Person In Charge 1 (PIC1D1)	Operational Staff 1 (OP1D1)	Operational Staff 2 (OP2D1)
Captures email in the DDMS and follows the <i>Retention Schedule</i> provided by NAM.	Accepts email as evidence based on the guidelines from NAM in <i>Electronic Records Management: Managing Electronic Records in the Unstructured Environment</i> .	Follows MAMPU guidelines on email records in the <i>DDMS Manual</i> . Follows NAM guidelines on paper records specifying <i>Managing Public Office Records</i> guidelines.
Identifies email as evidence based on practice by looking at the email formatting (e.g.: formal or informal, signature, letterhead etc.), a valid account domain and referring to the transaction log provided by the DDMS.	Identifies email as evidence based on a delivery report in the DDMS and a valid sender email account. Follows NAM and MAMPU guidelines and Circular Letter: No 1/2003	Identifies email as evidence based on the DDMS audit trail (which provides the transaction log containing the date, sender and recipient).

Table 12: Management of Email Records in Department 1

PIC1D1 indicated that Department 1 complied with the guidelines given by MAMPU and NAM for managing email records, and specifically the guidelines in “*Managing Public Office Records*” (National Archives of Malaysia, 2016) and the *DDMS Manual* (MAMPU, 2014)". Moreover, PIC1D1 suggested that this department thought that the DDMS helped in improving the level of efficiency in managing email records:

"The DDMS assists the department to organise its records. The DDMS is easier, because we can search for the file needed. The file title and attachment number will be generated automatically and it makes us respond faster and take action immediately."

Department 1 was using the DDMS to identify email records as evidence of business processes. It was fully compliant with the *DDMS Manual* and *Managing Public Office Records* guidelines for printed emails and filed in a centralised registry, because the staff printed emails (or at least their first page) and filed them in a physical file in the centralised registry. Compliance was the result of the positive influence of people, such as the PIC, RO and RA and staff in the Information Management Division, being key players in record keeping and the DDMS. They set a good example for the Ministry.

5.5.3 The DDMS in Ministry Department 2

Department 2 (D2) has four divisions and its major responsibility is to plan, coordinate, implement, monitor, analyse and ensure the efficiency and effective development of the communications and multimedia used by the Ministry, and the implementation of projects to ensure equal access to the communications infrastructure so that it is more economical for communications across the country. Interviews were conducted with staff in the Infrastructure and Application Division. PIC1D2 was responsible for planning, coordinating, implementing and monitoring the implementation of projects which ensure that the communications infrastructure and one of the two operational staff (OP2) was the department's Records Assistant. At the time of the interview, PIC1D2 had been with the Ministry for two months. They had managed paper records in their former government agency and were reluctant to manage electronic records specifically using the DDMS.

Person In Charge 1 (PIC1D2)	Operational Staff 1 (OP1D2)	Operational Staff 2 (OP2D2)
Manages email by instructing OP2D2 (PIC1D2's secretary) to print and file it in a decentralised registry.	Manages email by printing and filing in a centralised registry and also manages it using the DDMS.	Manages email by printing and filing in a decentralised registry.
Identifies emails as records only once they are printed and filed in a physical file in a registry.	Identifies email as evidence if it is composed by the Head of Department to give directions to operational staff; these emails need to be printed.	Identifies email as evidence if it is composed by the Head of Department to give directions to operational staff; these emails need to be printed.

Table 13: Management of Email Records in Department 2

This department had partially implemented the DDMS. Email was being managed in paper form and also electronically (see Table 13). All three staff captured emails by printing them and filing them according to NAM's file classification scheme, specific to paper records, in the centralised registry or a decentralised registry according to the types of records (open-access or classified) (Ministry of Communication and Multimedia Malaysia, 2016).

Department 2 only considered emails to be records after printing them. This practice is partially compliant with the *DDMS Manual* (MAMPU, 2014), which does not require paper capture, and follows the instructions of PIC1D2 who was reluctant to use the DDMS, preferring instead to view records in paper format. This department is inconsistent in terms of capturing email in the DDMS. PIC1D2 was reluctant to use the DDMS and only accepted printed email as evidence, but PIC1D2 assigned OP1D2 to capture certain emails in the DDMS.

However, the choice of which emails needed to be captured in the DDMS depended on the PIC1D2's decision and the reasons for their choice were not identified. The influence of PIC1D2 on operational staff in the department was perhaps unsurprising because of their position, which was more senior than that of the RAs, and therefore more dominant. However, the Records Assistant (OP1D2) did use the DDMS to manage outgoing email records, finding it helpful in tracking records in the department.

5.5.4 The DDMS in Ministry Department 3

Department 3 (D3) has four divisions and is responsible for matters related to planning, research, implementation and monitoring of the Ministry's policies and in managing relations and two-way cooperation in the field of communication and multimedia between Malaysia and other countries. Interviews were conducted with the PIC and two operational staff (PIC1D3, OP1D3 and OP2D3) in the Strategic Planning Division.

This department had not implemented the DDMS to manage its email records because its records are categorised as confidential, and the DDMS was only to be used for open-access records accessible to any employee of a government agency. However, PIC1D3 supported the implementation of the DDMS for managing email records in the Ministry. All three staff captured emails by printing and filing them according to the file classification scheme. When they sent or received an email via the DDMS, the email provided a link to the DDMS. Since Department 3 had not implemented the DDMS to manage its email records, OP2D3 managed their email records in paper format in their decentralised registry, according to the *Managing Public Office Records* guidelines from NAM.

However, OP2D3 also managed them electronically on their computer by using their own procedures to ensure that they could be retrieved efficiently. They kept a copy of the email in a folder on the computer for future use and the paper record was filed in the department's decentralised registry.

Person In Charge 1 (PIC1D3)	Operation Staff 1 (OP1D3)	Operation Staff 2 (OP2D3)
Manages email by printing and filing in a decentralised registry.	Manages email by printing and filing in a decentralised registry. Views email that has the DDMS link by using the system.	Manages email using own practices on computer but also by printing and filing in a decentralised registry.
Identifies email as evidence if the email has approval from the Head of Department (HOD) or it is a carbon copy (CC) sent to the HOD.	Identifies email as evidence if it is sent by the Head of Department to give directions to operational staff; these emails need to be printed.	Identifies email as evidence if it is sent by the Head of Department to give directions to operational staff; these emails need to be printed.

Table 14: Management of Email Records in Department 3

As Table 14 shows, Department 3 identifies email as evidence. This is clearly based on authority and only counts when the email is composed or approved by the Head of Department, and gives directions to operational staff, or when it is a 'carbon' copy received by them. This department would prefer to use electronic records and the DDMS as it would improve efficiency in the retrieval process. However, currently it cannot use it due to its records being security classified (i.e. protectively marked) rather than public (i.e. open). Hence, a hybrid record keeping system is operated. One of this department's functions is to manage communication and multimedia and this may influence the perceived need for electronic record keeping.

5.5.5 Summary Comparison of the Ministry Departments

In the context of record keeping in the Ministry of Communication and Multimedia Malaysia, the three departments displayed some similarities and differences in their management of email. Overall, email management was fully compliant with the *DDMS Manual* (MAMPU, 2014) and *Managing Public Office Records* guidelines (National Archives of Malaysia, 2016) in one department, partially compliant with the DDMS and fully compliant with the

Managing Public Office Records guidelines in the second department, while the third department was not compliant with the *DDMS Manual* but compliant with the *Managing Public Office Records* guidelines.

Department 1 was fully compliant with the *DDMS Manual* and *Managing Public Office Records* guidelines, partly due to the information management functions being located within it. Being responsible for managing the DDMS and ICT development in the Ministry, they had a vested interest in the system. This department's main responsibilities also included managing and organising the entire Ministry's administrative information, which meant that they had to set an example by putting principles into practice and complying with the DDMS implementation. The Head of Department fully supported the implementation of the DDMS and persuaded staff to use it and follow the instructions given by the records staff based on NAM's guidelines (National Archives of Malaysia, 2016) and the *DDMS Manual* (MAMPU, 2014).

Department 2 was partially compliant with the DDMS and compliant with the *Managing Public Office Records* guidelines (National Archives of Malaysia, 2016). In the division from which staff were interviewed the principal officer's (PIC1D2) preference for paper record keeping, even for electronic records, was the major negative influence on the department's practice and on the operational staff's adoption of the DDMS.

Department 3 did not comply at all with the *DDMS Manual* since it was not functionally fit-for-purpose, specifically in terms of security, but was compliant with the *Managing Public Office Records* guidelines. Functional requirements for the record keeping system include access management (ISO 16175:1, 2010). The electronic record keeping system requirement to maintain the authenticity and reliability of records includes requirements for access and security (ISO 16175:1, 2010). Interestingly, this department had used a system called e-cabinet that was designed to manage the types of classified records it stores.

However, PIC1D3 indicated that "the e-cabinet system implementation failed since there is no support from the users who prefer to use paper based records." However, Department 3 supported the implementation of the

DDMS but not the e-cabinet system. The requirements of the e-cabinet system are unknown, so cannot be compared with the DDMS.

Regardless of the fact that the DDMS did not meet the security classification requirements of the department, the staff's preference for paper records could be one of the factors contributing to non-compliance based on PIC1D3's comment regarding the failed e-cabinet implementation.

5.6 Email

5.6.1 Email as a communication medium

Email is widely used as a core tool for business communication in the Ministry. Both the senior and operational staff interviewed claimed that it was an efficient tool for communication (Table 15).

Department 1		
PIC1D1	OP1D1	OP2D1
<ul style="list-style-type: none"> • Can be accessed through mobile devices • More efficient • Accepted as a record 	<ul style="list-style-type: none"> • Efficient • Formal communication • Paperless government 	<ul style="list-style-type: none"> • Efficient • Effective • Economical • Safe (direct to the recipient) • One of the government's communication media
Department 2		
PIC1D2	OP1D2	OP2D2
<ul style="list-style-type: none"> • Efficient • Fast • Immediate response 	<ul style="list-style-type: none"> • Easy • Efficient 	<ul style="list-style-type: none"> • Immediate response • Early notification
Department 3		
PIC1D3	OP1D3	OP2D3
<ul style="list-style-type: none"> • Efficient • Saves time • Hybrid : email and letter 	<ul style="list-style-type: none"> • Paperless • Can inform if the action for the project has been taken or not. It is based on the email history. 	<ul style="list-style-type: none"> • Easily retrieved • Accessible by mobile device • Supports urgent action (employees can access the email as long as they have internet connection and can access by mobile phone)

Table 15: Summary of Interviewee Perspectives on the Benefits of Using Email Instead of Letters in the Ministry Departments

For example, senior staff from different departments commented:

"Email is efficient because it enables a fast response. The information can be disseminated in a short time" (PIC1D1) and

"By using email, the level of efficiency in the department has increased by 50%. We also receive immediate responses, within 24 hours or less." (PIC3D3)

Comments from operations staff included that:

"Email is more practical compared to a letter especially in this technological era" (OP1D3);

"Email is paperless and enables an immediate response. As for a letter, we need to obtain a signature. There are too many procedures" (OP2D3);

"Email is easy to search and retrieve" (OP2D2);

"Most people do respond to email quite quickly and we can identify if the email has been read or not" (OP1D3) and

"We use email to notify the recipient about a certain matter. We will send a formal letter afterwards" (OP1D2).

The ability to respond immediately, as well as providing pre-notification, are the reasons for the improvement in productivity cited by PIC3D3 (above). These quotations are evidence of the view that email is a swift and efficient form of communication, but also that it is used as an informal method of communication, the letter being the formal communication method (OP1D2 above).

The RO highlighted the benefits of email for communication but also the barriers to email usage in the Ministry:

"Email is fast and easy to use. We can send the same email to different people at one time by using a Carbon Copy (CC) or Copy to selected individuals. It is unlimited and non-printed. In the Ministry, we send a document in the DDMS through email. Every Ministry employee is a DDMS user, so it is easy for us to email using the DDMS with no attachment, only a link. There is no issue of attachment size. However, if the email needs to be sent to someone who is not from the Ministry, we need to attach the attachment. This is one of the difficulties of using the DDMS."

The DDMS can only be viewed by a user who has a DDMS account and it is also restricted to that particular ministry only viewing its records. So, the link cannot be viewed externally. However, despite email being the chosen communication medium in the Ministry, because of its efficiency and accessibility via mobile

or electronic devices, letters are still being used. The trust issue with email records shows that people prefer paper based records. The implementation of hybrid records keeping is an example of the fact that electronic records have not yet been fully accepted in the Ministry.

5.6.2 Email as Evidence

Email has been accepted as evidence in the Malaysian Government as a result of the requirements of laws and regulations such as the Security Regulations and the National Archives Act 2003 and supporting policies and standards (National Archives of Malaysia, 2010). Circular Letter No.5 Year 2007: Office Management states that emails in the government sector are public records (Malaysian Government, 2007). Email is used to support business processes and as proof of transactions. However, the interviewees held different views about the status of email as evidence; some of which were surprising. NAM considered that email had been accepted as evidence in the government sector and that this was supported by the National Archives Act 2003:

“Email is a type of electronic record. Records have context and content. So email can be accepted as evidence in the Government.”
(NAM1)

However, MAMPU2 stated that it is still not accepted as evidence in a court of law:

“At this moment we are in a hybrid record keeping system situation. We are heading towards paperless government but it will take time. The reason is because physical records are still needed as evidence. In a court case they still need paper records. The DDMS is a record keeping system that captures electronic records but the records captured need to be similar to the printed records in the registry.”

The RO, trained by NAM, was uncertain about the evidential status of email, claiming that:

“Email is a trend in the public sector. People often use email to communicate rather than by letter. It is easy. Some employees write email informally and because of this, they avoid capturing those emails in the DDMS. If it is a formal matter [then] to write it formally, even if it is an email. The government provides guidelines for writing email in the public sector. [The guidelines prepared by NAM and MAMPU: Electronic Records and Archives Management Policy, Electronic Records Management Guidelines, and Electronic Record Management Procedure in the Digital Document Management System Application (DDMS)]. These show that email has been accepted as a record but, in court I’m not sure if it has been accepted as evidence or not.”

This confusion and differences of opinion among staff in the two organisations responsible for setting policy and providing systems for managing the government's records, and a records professional working in a Ministry department is disconcerting. If they are unclear about the evidential status of emails then they cannot give clear guidance to government employees and expect them to understand and comply with it.

In the Ministry departments, all of the PICs considered that email had been accepted as evidence by the Malaysian government (Table 16). PIC1D1 specifically stated that "Email has been accepted as one of the formal records in the government agencies" and went on to say that "to be accepted as evidence, email has to be sent by a valid email account."

Only PIC1D3 referred to policy and guidelines as confirming the evidential status of email. Other reasons for the beliefs revolved around practice rather than policy, in particular its use in formal communication and by very senior Ministry staff. PIC2D2, who was against accepting email as evidence in the government sector, stated that email can be accepted as evidence on two conditions:

"If people ask us to provide email as evidence, we can open the email in front of them through our email account or by showing them a printed version of the email that is filed in a physical file. "

This practice is impractical and makes no sense since the printed records and email records in the email system are the same. The Ministry employees have DDMS accounts and they can view the records in the system without needing a face-to-face meeting just to see the email as evidence.

The views of operational staff, unsurprisingly, also varied. For example, OP1D1 believed that email had been accepted as evidence "based on the circular letter"; however, OP1D2 thought that email was not considered to be evidence in their department. Even though NAM states that any government records, including email, can be accepted as evidence, email has still not been fully accepted as evidence. Whilst OP1D2 did not give a clear reason, it may have been similar to the one given by OP2D3 that "senior employees are reluctant to accept email as records because they prefer paper based records".

Department 1		
PIC1D1	OP1D1	OP2D1
<ul style="list-style-type: none"> Email has been identified as evidence because it has been accepted as records in the public sector. 	<ul style="list-style-type: none"> Email has been identified as evidence based on the (Circular Letter No.5 Year 2007: Office Management). 	<ul style="list-style-type: none"> Email has been identified as evidence if it is a formal email. Email is a public record used in daily tasks.
Department 2		
PIC1D2	OP1D2	OP2D2
<ul style="list-style-type: none"> Email has been identified as evidence if it is a formal email. 	<ul style="list-style-type: none"> It is easy to trace the email records that have been received by using audit trail. 	<ul style="list-style-type: none"> Email has been used by the top officer, so it has been identified as evidence.
Department 3		
PIC1D3	OP1D3	OP2D3
<ul style="list-style-type: none"> Email has been identified as evidence based on the Letter of Director General of MAMPU, 1 July 2010: 'Stabilization Use and Management of Emails at Government Agencies' The Chief of Secretary in the Ministry uses email as evidence 	<ul style="list-style-type: none"> Email has been identified as evidence to make the business process easier and it is a communication medium in the current environment. 	<ul style="list-style-type: none"> Email has been identified as evidence and it is used to call a meeting.

Table 16: Reasons Email Records are identified as Evidence in the Ministry Departments

This perspective could involve an issue of technology acceptance, but it may also be a practical issue. Printing an email and filing it in a physical repository is a requirement for agencies that have not implemented an electronic record keeping system:

“In 2010, there is a guideline on managing email published by MAMPU. MAMPU is more into usage and NAM focuses on preserving and archiving the email records. If the agency does not use an ERMS, we recommend they print and file the email records and share them in a directory. The guideline was published in 2009 but there is no test to measure its implementation.” (NAM1).

5.7 Email Management Processes

There are guidelines for creating email in the Ministry regarding their content, context and structure in order to maintain them as records. The guidelines are the *DDMS Usage Manual for Public Sector* (MAMPU, 2014) and the *Guidelines for Managing and Preserving Email for the Public Sector* (National Archives of Malaysia, 2010). The former states that the DDMS provides the technological component of a framework for the systematic and structured management of records, linking electronic and paper based records, and maintaining the content and structure of the records over time. The Ministry refers to the *DDMS Manual* from MAMPU (2014) for the use of email in the public sector. The guideline details the procedures for creating, capturing and managing email as an audit trail to support business transactions.

5.7.1 Creating email

Every employee has the authority to use the email system to create email messages. However, the higher the employee's level in the Ministry hierarchy, the higher their influence in deciding which emails can be accepted as records. There are differences in the way PICs and operational staff create email. The PICs discussed the authority for creating the email, with PIC1D1 saying that:

“Sometimes, in order to complete our task, we have to communicate between each other, within or outside the Ministry. The task normally begins with an instruction from the top management. We choose email to communicate since it is more efficient compared with letters.”

And PIC1D2 stated,

“I will compose and send emails. As for incoming emails, I will print them out and pass them to a clerk to file in a decentralised registry.”

As for operational staff, OP1D2 stated

“We create email based on a senior officer's instruction. For example, a senior officer will ask us to create email calling a meeting for the whole department (D1).”

PIC1D1 was the only one to mention the purpose of creating email; however, PIC1D2 mentioned the practice of email creation in their department. In contrast, across all three departments, the operational staff stated that email was created based on the instructions of senior management (the PICs) or on their own initiative if required in any other circumstances.

Email creation in the Ministry differs according to department. Although the methods of creating email might be different, the structure of the creation of a formal email was the same in the three departments whose staff that took part in the research, because they referred to the *Guidelines of Managing and Preserving Email for the Public Sector* (National Archives of Malaysia, 2010) in composing them. As for informal emails, their structure was subjective; for instance they may not have had a subject header or the name of the sender (as in a formal signature).

Emails created in Department 1 were created based on the DDMS implementation and the *DDMS Manual* (MAMPU, 2014). Department 2, which was only partly compliant, also created email by referring to the *DDMS Manual*. However, not all email records were created using the DDMS, as mentioned by OP1D2, where the factor affecting the composition of emails depends on PIC1D2. Since Department 3 did not comply with the implementation of the DDMS, they method for email creation is only by using the Microsoft Outlook email system. There are two options for creating email in the Ministry - through the DDMS or the email system. The process of email creation in the DDMS is accomplished by selecting records in the DDMS and sending them to the recipients. However, the process of creating an email through email system is a normal procedure like composing email messages using an email account.

5.7.2 Capturing Email

The Access Matrix in the *DDMS Manual* (Table 11) specifies who has responsibility for capturing email records in the DDMS. According to MAMPU (2014), the creator needs to capture the email record. However, if email is received from an external, recipient or if there is more than one recipient, the first named person needs to capture it. Interestingly, it is the Head of Department or senior officer who decides which emails need to be captured in the DDMS. The RO claimed that:

“Each email user who receives a formal email needs to capture it in the DDMS and the physical file. The email capture is based on their own awareness. As a RO, I can only inform and make them aware of the process of record capture. But, if it is not captured we do not know. It's hard to monitor whether every employee in the Ministry captures email records or not. Records Assistants in each department need to monitor the staff in their departments. We need to notify the user of the consequences if records are not captured. It is possible to check each the DDMS account to see if the records have been captured or not and give them penalties. There are many types of records in the DDMS where the user needs to make selection based on their knowledge of the records. This makes them hesitant to capture records and to use the DDMS and creates other issues like forgetting passwords to log in, and unfortunately this usually happens among the senior officers [PIC and above in the Ministry hierarchy].”

PIC2D2 said: "I capture the email based on my understanding of the email contents." It is crucial for the senior officers [PIC and above in the Ministry] to understand email messages before capture to ensure that they are valuable as records. As a superior officer in Department 2, PIC1D2 used their authority to complete the task of capturing emails, passing the printed email to the clerk for the filing process, and choosing according to their own preference for capturing it in paper form instead of electronically in the DDMS.

Operational staff discussed the reasons why email needs to be captured: "Email will be filed according to the senior officer's [PIC] instruction" (OP2D2) and "The top officer will determine which records need to be captured" (OP2D3). However, in Department 2, neither PIC1D2 nor OP2D2 were using the DDMS to capture email. The process of filing was usually accomplished by the clerk (OP2D3).

In the *DDMS User Manual* (MAMPU, 2014), there are six scenarios for creating and capturing documents: capturing a digital document, capturing a physical document (scanning the document), capturing an MS Outlook email, capturing an MS Office document, capturing a digital audio or video document, and routing a record through email.

In Department 1, the only department that fully complied with the DDMS, the capture of audio and video digital documents scenario had not occurred. Department 1 mostly captured paper records that had been converted into pdf format in the DDMS. Once all of the procedures for creating a new DDMS

record were completed, the data entry field for metadata would appear, which the user needs to complete. The procedure to fill in the metadata is done manually by keying it in. However, some metadata are automatically completed; for example, the email date and time sent or received (MAMPU, 2014). At this point, the system also provides a security tab for the record, which is termed the access control. Users may decide who can access the record. Even though the records in the DDMS are open-access and accessible to any employee of a government agency, there is an option where the creator or person doing the capture can decide who can view them according to preference or security issues. Only the RO can alter the security access level for records in the DDMS. Another use of the DDMS is to make a cross-reference to link or make connections between records and files. This can be done in the DDMS by using the related records tab. However, only the RO can create the cross-reference, as advised by the RA from each department who is more familiar with and better understand, the subjects of records held in the department.

5.7.2.1 Capturing Paper and Digital Records in the DDMS

The user may attach a paper record such as a letter or digital record to the email recipient, yet paper records still need to be captured in the DDMS (see Figure 4). The process of capturing a paper record is completed by scanning it and saving it in the DDMS. For instance, if a circular letter is received from MAMPU or NAM, the responsible person needs to convert it into pdf format, capture it in the DDMS, and send it via email to all Ministry staff.

Users may choose to scan and a paper record convert it into digital pdf format (see Figure 4) and to upload the pdf into the system and create a new record, choosing the type of record they have created, such as an email, audio, Act, chart, cabinet result, or quotation, others from a dropdown menu as shown in Figure 5).

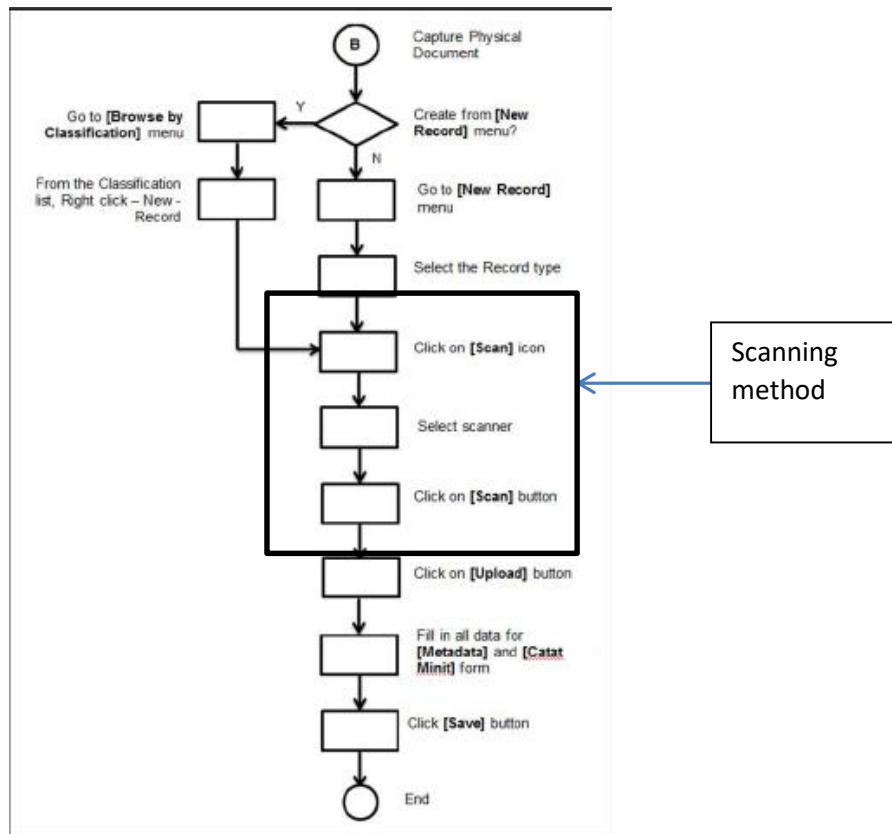


Figure 4: Process for Capturing Paper Records in the DDMS

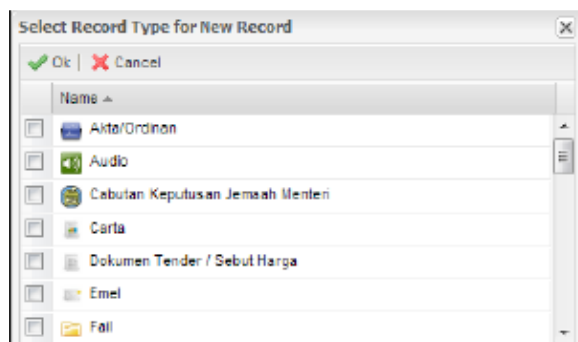


Figure 5: Menu Options for New Record Types

Once all of the procedures for creating a new record have been completed, the data entry field for metadata will appear, which the user needs to complete (Figure 6). Metadata tabs contain information that describe the record; for example, title, file, reference number, date, name of sender, and name of recipient and others (MAMPU, 2014). At this point, the system also provides a security tab for access control for the record (Figure 6). The user may decide who can access the record. However, there is one person in the ministry (the RO) who can access all records in the DDMS, even though

access control has been assigned, because of their responsibility for monitoring and managing the DDMS and all records in the Ministry. As mentioned in section 5.7.2, there is another tab in the DDMS which is related records that only and the RO can link a record to a record, a file to a file or a file to a record. The process of capturing audio/video material is similar to capturing paper and digital records (pdf).

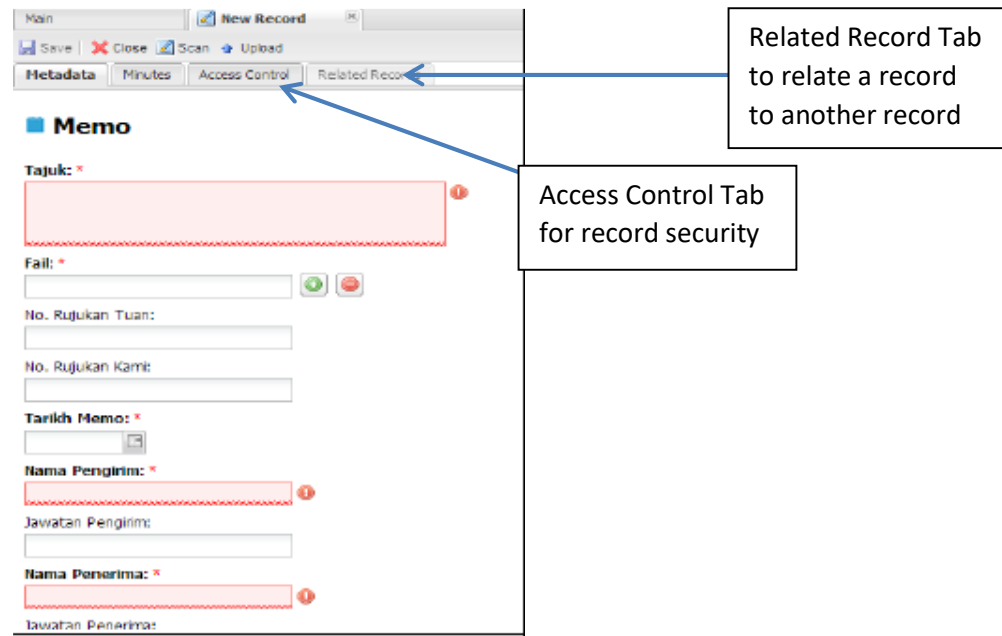


Figure 6: Related Record and Access Control Tab

As for capturing email through MS Outlook, this process starts once a user receives the email in MS Outlook. Since it is add-ins, the user is able to capture records in the DDMS directly from Microsoft Outlook. The process is as shown in Figure 7 and 8. Once, the process of capture is complete, a new email record will appear, as seen in (Figure 9). The title, sender and recipient are automatically taken from the email. The user may browse the file classification scheme using the file classification scheme options. For capture from MS Office, the procedures are the same as from MS Outlook, and there is a capture tab in MS Office linked to the DDMS (Figure 10). Email can be captured by the DDMS and the user can send records from the DDMS to recipients as long as they have the DDMS account. There is a 'send to' button in the DDMS, where the user may browse records and send them to recipient/s. The routing component in the DDMS allows the user to directly attach a document to an email (see Figures 11 and 12).

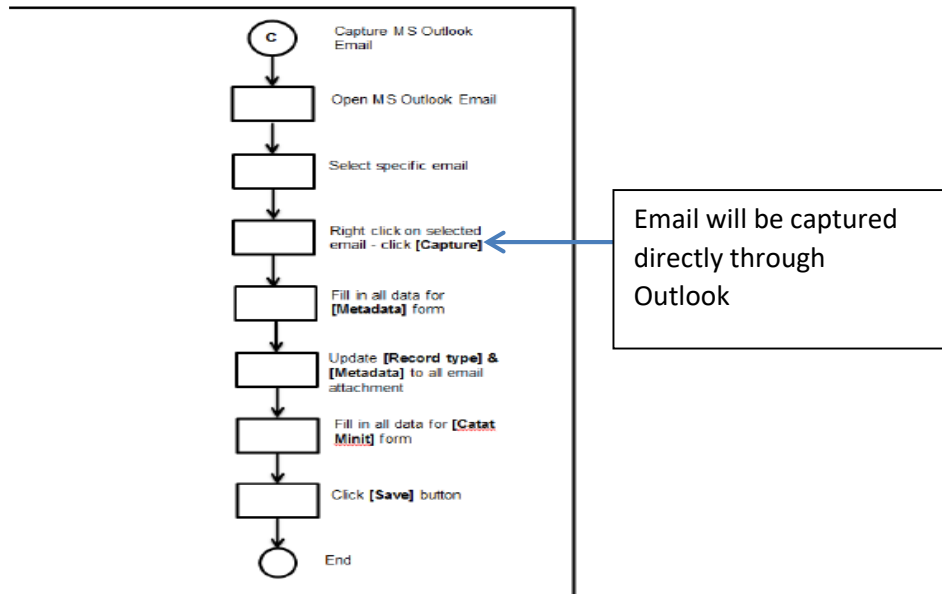


Figure 7: Process for Capturing Email through MS Outlook in the DDMS

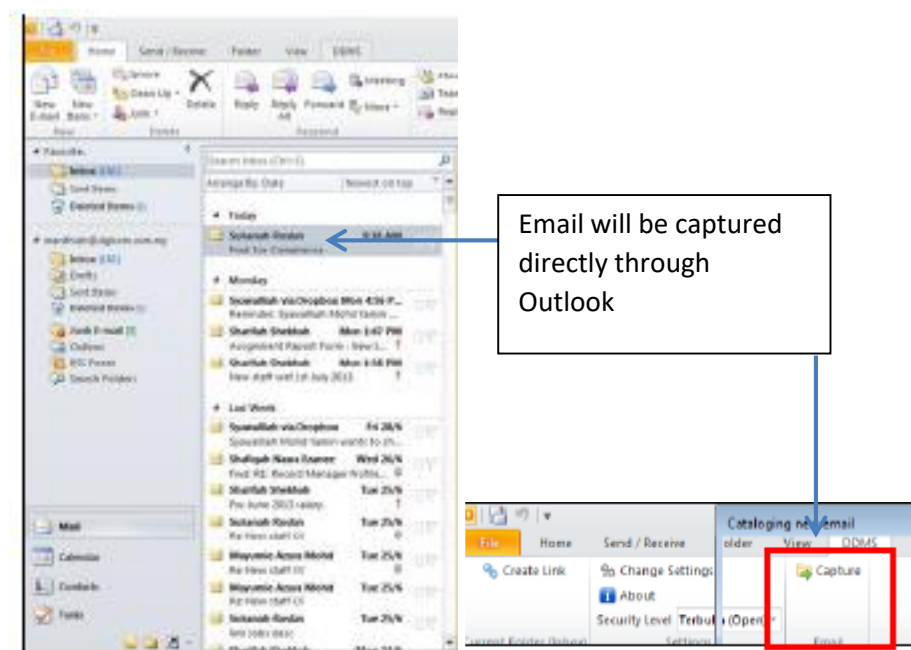


Figure 8: Email Capture Tab

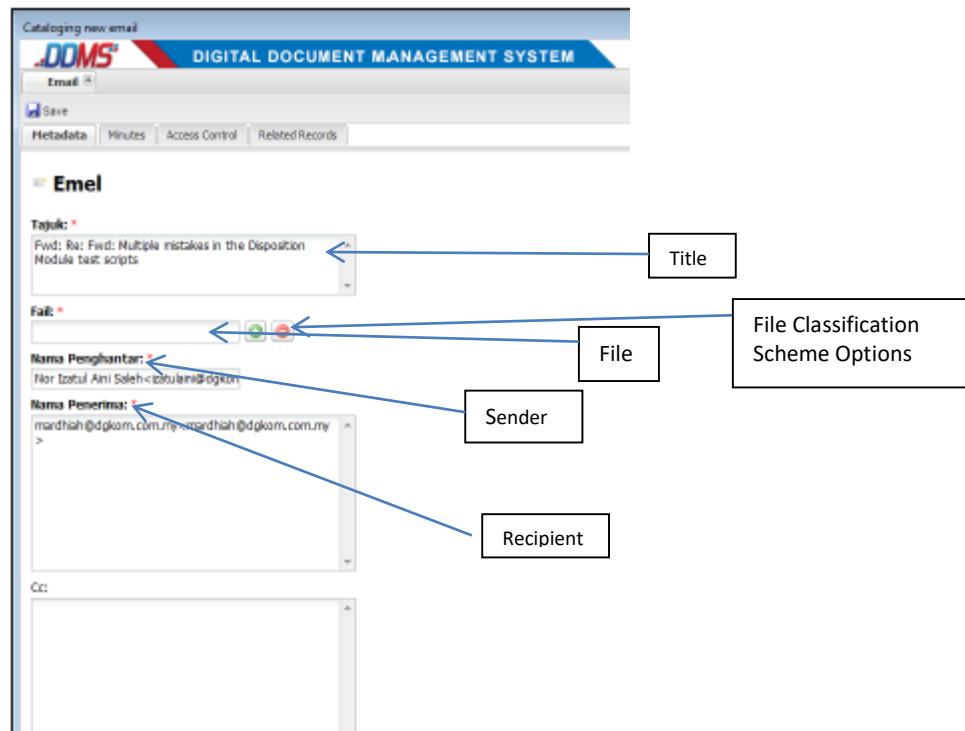


Figure 9: Details of a New Email Record

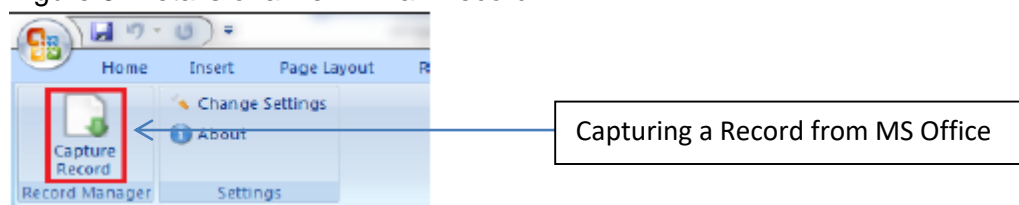


Figure 10: Capturing Records from MS Office

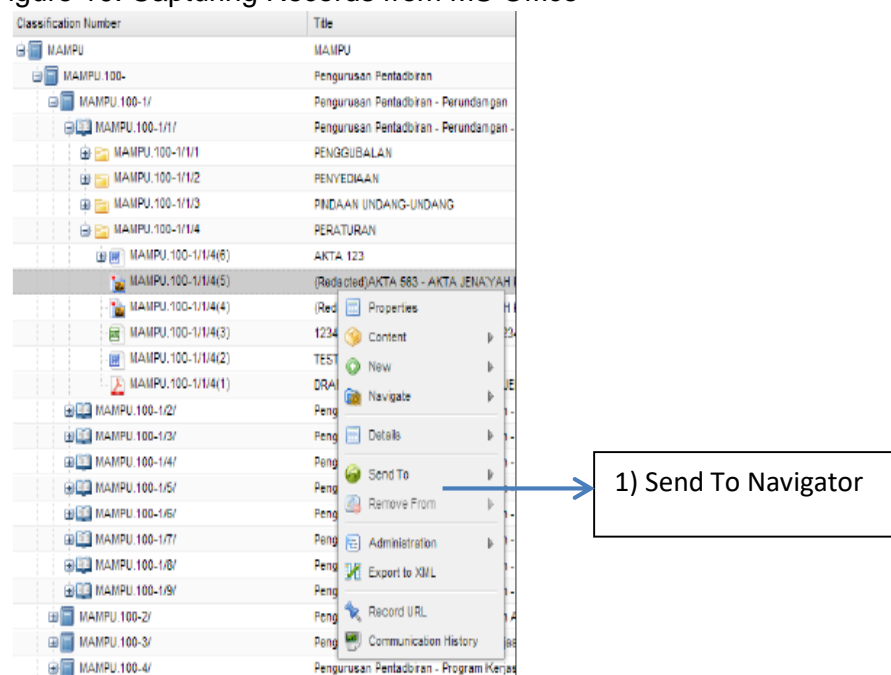


Figure 11: Routing an Email in the DDMS

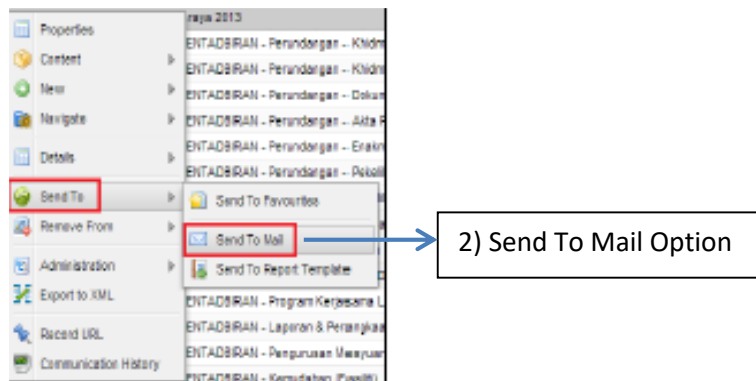


Figure 12: Send To Mail Option

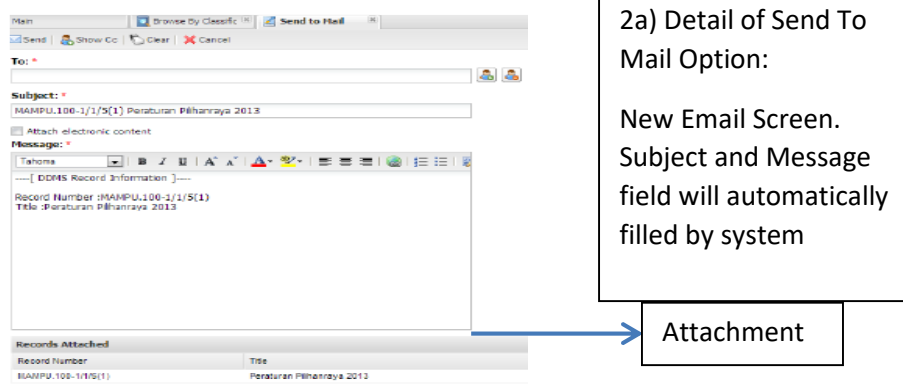


Figure 13: Send To Mail Detail in Email System

5.7.3 Organising Email

Questions here relate to the arrangement, storage, classification and maintenance of email records in the Ministry, which organises email records based on department. The processes of organising the email records can be considered to be compliant with the *DDMS Manual* (MAMPU, 2014) whereas printed email records should be organised by referring to the guidelines in *Managing Records in Public Sector* (National Archives of Malaysia, 2016). The implementation of these processes is conducted according to the departments, as mentioned in section 5.5. However, based on the present findings, these processes are usually completed by the department's RA. The findings show that most of the discussion concerning the organisation of email systems was with the operational staff. This is unsurprising given the hierarchical authority in the Ministry. PICs give instructions, make decisions and instruct operational staff to complete tasks as evidenced by PIC2D2: "I assigned the filing task [printing and filing in a physical file] to my clerk." Although OP2D2 said that "If the records are open-access records, I

can determine the file classification, however if they are confidential records the top officer (PIC) will need to inform me which file classification they belong to.”

Department 2, which partly complies with the DDMS, organises their records based on their own practices combined with some information from NAM regarding record keeping. For example:

“We classify the email based on its content. And the file reference number is determined by the Records Management Unit” (OP2D2).

“I classify the records according to type. I put the record type, either email or paper based, next to the record’s date.” (OP1D2)

“I just fill in the classification number based on my instinct.” (OP1D2)

“The file is arranged according to a chronological arrangement.” (PIC2D2)

“I will delete irrelevant email after I have read the contents.” (OP1D2)

Some of these practices reflect a lack of understanding of classification and the use of the file classification scheme, which is perhaps surprising given that paper records are organised using the registries. The fact that OP2D2 said that “there is no folder in the computer for email records like a physical file for printed email” suggests a lack of familiarity with the DDMS. Overall, the practices in Department 2 are contrary to those mandated, as OP2D2 revealed in saying that “we combine all the email records and sort by date.”

In Department 3, responsible for policy development, the PIC stated that email records in the Ministry need to be managed by referring to the circular and guidelines from NAM. PIC3D3 did not mention the need to follow the guidelines provided by MAMPU, and neither was the existence of the *DDMS Manual* (MAMPU, 2014) noted. They said that “for all records management we follow the guidelines and the circular from NAM.” However, this is the department that cannot implement the DDMS because it is not functionally fit for the purpose. However, Department 3 organises email records in the same way as they organise paper records, by referring to *Managing Public Office Records* guideline (National Archives of Malaysia, 2016). PIC3D3 mentioned that “email records in the department are classified using chronological order since we followed the ISO standard (ISO 16175:2, 2011).

Yet OP1D3 indicated that "we classify the records according to the file subject."

Even though they said they followed the circulars and guidelines given by NAM they still have their own ways of working where each individual, and especially senior officers, create their own files and keep additional copies for reference and evidence (OP1D3).

5.8 Technical Issues

Public servants use the Microsoft Outlook email system provided by the 1GOVUC service. 1GovUC is part of the government cloud service. The DDMS operates as an add-in which is a device or piece of software that can be added to a computer to give extra features or functions, with this service. However, the operation of the DDMS proved to be unstable with add-ins at the beginning of the implementation, with the RO claiming that:

"There was a problem with add-ins between the DDMS and Microsoft Outlook. The system needed to be reinstalled many times. People are reluctant to capture email records by using the DDMS because of this. Perhaps MAMPU should have recognised this issue and the government agencies' requirements before implementing the DDMS".

This issue is perhaps surprising given MAMPU's use of the ISO 16175:2 (2011) guidelines and functional requirements for digital records management systems, and it is certainly something that should have been tested prior to rollout.

Other emerging technical issues related to email in the Ministry relate to email storage in the DDMS and system availability. One of the purposes of the DDMS is to save storage space by providing a link in an email message instead of sending an attachment. A large attachment can occupy a lot of space in an email. The DDMS eliminates the need to attach records by replacing attachments with a link to a single location in the DDMS. However, since Department 3 has not yet implemented the DDMS, they still face email storage issues. As PIC1D3 commented:

"The Ministry does not own hardware for storage. Staff need to work on their own initiative in maintaining email. Email storage relies on the employee's position - the higher the position, the higher the storage capacity [they are allocated]".

In terms of the DDMS, PIC1D1 highlighted a concern about accessibility:

“Email is captured in the DDMS. If there is a technical problem, the DDMS cannot be accessed. The DDMS is not an independent system which cannot be backed up to another medium.”

Since the DDMS is a centralised system that is monitored by MAMPU, only MAMPU has a back-up. If any technical problem occurs MAMPU is the only party that has the authority to deal with it. Given that the DDMS has been implemented by at least 31 government agencies and has more than 20,000 users, it seems impractical for MAMPU to be the only agency allowed to manage it for all government agencies.

5.9 Compliance and Governance

Appropriate email management in the Ministry is based on compliance with the principles, policy, circulars and guidelines developed by NAM and MAMPU. They also provide the DDMS, the email tools, including the server and email systems from 1GOVUC, for the management of email records in the ministry. As MAMPU¹ stated:

“Compliance with policies and guidelines is important to ensure email management is efficient and effective based on individual effort. The guidelines, Standard Operating Procedure (SOP), have been created but we rely on users to comply with the principles.”

A Standard Operating Procedure (SOP) is a set of written instructions that documents a routine or repetitive activity to be followed by an organisation (United States Environmental Protection Agency, 2007). However, even though MAMPU (2014) has provided the *DDMS Manual* as an SOP, MAMPU relies on users to comply with the instructions. As the principal body responsible for email management in the Government of Malaysia, MAMPU may need to consider applying formal monitoring of email implementation to ensure that users comply with the *DDMS Manual*. PIC1D1’s perspective on compliance in managing email records was as follows:

“[it] started from the internal circulars and guidelines on DDMS implementation in Department 1. The rules and legislation come together with the DDMS implementation. Awareness of electronic records management promoted as the DDMS was implemented. However, which of the internal circulars on managing email records that were being referred to by Department 1 is uncertain. It could be either the circular from the Chief Secretary to the Government of Malaysia (unknown which circular they referred to) or that from Head of Department 1.

In terms of awareness of the DDMS PIC1D1 stated:

"There are guidelines for records management context and it is implemented in the DDMS. So, we just follow what's required in the DDMS."

Email practice is governed internally by staff in the Records Management Unit in Department 1. The Unit is accountable for providing a link between the email system and the DDMS. OP2D2 stated that "All email transactions I made have been through the Records Management Unit in Information Management division" and "this unit is responsible for monitoring the email in the context of record keeping. I will monitor the email and give advice regarding the file classification scheme" (RO).

This unit only monitors email records that have been captured in the DDMS and filed in the centralised registry. With a limited number of staff, it is possible to monitor each email one-by-one. There are 597 DDMS users in the Ministry of Communication and Multimedia and the number of emails received and sent could easily be triple the number of users. Monitoring is done manually by going through each file in the DDMS. The process involves checking that the records have been captured correctly in the file classification scheme and that they are filed in the centralised registry (as back-up), and ensuring that accurate metadata has been added, based on the *DDMS Manual* (MAMPU, 2014).

The purpose of the Malaysian Government in implementing a hybrid record keeping system is to provide a back-up of the electronic records held in the DDMS. However, this practice does not simplify the users' business activities. Redundant work, such as in capturing and filing records, is performed for every single record. Furthermore, this practice seems impractical, with two members of staff including the RO in the Records Management Unit having to monitor the whole system.

The RO explained that:

"I'm monitoring the movement and the context of the records. If the staff would like to have the information that they are not allowed to view, I'll open it on behalf of them and explain the contents. The Information Management Division is more concerned with system administration for the Ministry. But every department has a system admin [a technical staff member responsible for helping their department in implementing the DDMS] because they know more about their records and staff." [See Table 11: Access Matrix for the DDMS].

The practice of opening records on behalf of other users is impractical and inappropriate. As a record keeping system, the DDMS should have a high level of security for the records held in the system. This practice contradicts the integrity of the records manager in handling records. This issue should be of concern to MAMPU, and especially NAM as they are ultimately responsible for protecting the integrity of the records.

However, since the RO is responsible for the Records Management Unit, the RO had raised awareness concerning email record keeping across the whole Ministry by sending out brochures, and encouraging Ministry employees within departments and with different roles to meet her personally if they had queries about email record keeping. She admitted that:

“We have not conducted a special records management programme, but the employees in the Ministry are encouraged to meet me for a consultation regarding records keeping in the department. I distributed brochures on email record keeping, and specifically on the DDMS and the file classification scheme. As a result, staff in the Ministry are making efforts to comply with records management principles and procedures.”

The principal governing procedure taken by the RO is to ensure that the employees in the Ministry are aware of and comply with the DDMS and the file classification scheme provided by MAMPU and NAM. However, the decision to comply with the DDMS and file classification scheme in the Ministry relies heavily on the management within each department.

As PICD3 pointed out,

“We have a procedure for managing our government records. Our filing system complies with the principles published by NAM and the email guidelines from MAMPU. We comply with the principles given in managing our records. We refer to the ISO standard in managing records in the Ministry.”

The ISO standard being referred to here is based on the NAM guideline that mentions ISO MS 2223-1:2009 (*Managing Public Office Records* guideline). However, Circular Letter No. 2 Year 2016 [Implementation of MS ISO 16175:2012 Information and Documentation-Principles and Functional Requirements for Records in an Electronic Office Environments] was published by The Prime Minister’s Department on 10th August 2016 (Prime Minister’s Department, 2016) after the interviews had been conducted, and therefore no questions were asked regarding it.

MAMPU's role is to govern the implementation of the DDMS across the Malaysian Government. This is executed by preparing the *DDMS Manual* (MAMPU, 2014) and training public servants in using the DDMS. However, there is no specific indicator used to measure the effectiveness of the DDMS implementation and email record keeping in the Ministry. Even though the DDMS project is collaboration between NAM and MAMPU, MAMPU took greater responsibility in governing the DDMS implementation. NAM as the subject matter expert gives advice on records management concerning functional requirements and the file classification scheme in developing and implementing the DDMS. NAM is less authoritative in managing the DDMS.

One of the issues related to compliance with the DDMS is people's preferences about paper based records which influence compliance on the DDMS. PIC1D2 said "I prefer to view printed records compared with electronic records and "Even though I'm supposed to handle and manage the DDMS but I'm not using it." They went on to say

"My name is listed as the DDMS user but I'm not using it."

Even where there is training in the use of the DDMS, as provided by MAMPU, NAM and personal training by the RO in the Ministry, employees were still reluctant to use the DDMS. The preference for paper records influenced employees who were not committed to the DDMS. PIC1D2 found that the DDMS is a system that is not helping to manage records in the department and, as the head of the division, PIC1D2 is biased towards the use of paper records, instead of the DDMS in the department. Perhaps the training provided should have been conducted before the DDMS was implemented not after implementation. The lower awareness of the DDMS as a record keeping system was identified by OP1D2, who was unsure if the DDMS is a record keeping system or just an office system in the Ministry. OP1D2's comment in response to a discussion about a registry system for electronic records in the department was that they were "not sure if there is a registry system for electronic records in this department." This is indicative of a lack of awareness and/or training provided about the DDMS. PICD2, who was opposed to the use of the DDMS, influenced the operational staff in implementing the DDMS in business processes and in not accepting email records as evidence unless they are printed. Lack of understanding of the principles and usage of the DDMS, even when there has been training provided in its use, is a possible reason for the partial implementation of the DDMS and why the technology has not been accepted in Department 2.

In addition, staff who are more senior in terms of years of service are more reluctant to use the DDMS and accept email as evidence. OP2D3 mentioned that,

“The senior employees are reluctant to accept electronic records especially email”.

This is supported by the RO’s claim that there is a top officer who prefers to use printed records instead of viewing email through the DDMS. The RO stated:

“In this Ministry there are some employees that insist on using paper records. They prefer to view physical records rather than view them on the computer. For example, there is one operational staff member who mentioned that her senior officer needs a printed email and does not like viewing [email records] from the DDMS”.

Besides people’s preferences, another issue highlighted by PIC1D2 is that using the DDMS does not enable current records to be traced and linked to former records:

“However, the DDMS has a problem since it is unable to trace the record’s history from the former records before the DDMS was implemented. In a way, I prefer to see the physical document on paper since I can hold and read it clearly, rather than read the electronic records from an electronic device.”

However, the DDMS does provide cross references between the DDMS records and a former paper record before the DDMS was implemented, by using common metadata such as the file name. However, PIC1D2 was clearly unfamiliar with the DDMS and so was unable to identify the cross-reference function.

PIC2D2 also stated that there was a weakness of the DDMS according to PIC2D2 perspective:

"Email cannot be updated in the DDMS. It is similar like an attachment."

If the DDMS users are sending records from the DDMS, the information will appear as a link to an email message (see Figure 15). However, in terms of email size, the link provided will reduce the size of the email message.

As we know the DDMS cannot accommodate classified records, and unfortunately the minister’s emails are classified as confidential records. This

contributes to the fact Department 3 is not compliant with the DDMS. OP2D3 indicated that:

"The minister sometimes uses emails and we classify those emails as confidential records."

PIC3D3 even mentioned that:

"Since the Former Chief Secretary to the Malaysian Government, Datuk Sidek, supported email intensively, we use email widely in the government sector."

This statement shows that there is support from top management for using email in the government sector. This statement could be a catalyst for the future development of the DDMS in the Malaysian Government and may encourage improvisation with the DDMS within departments to fulfil their business purposes so as to include all types of records.

Besides this, the culture among public servants influences the compliance and governance of email record keeping in the Malaysian Government. PIC1D1 mentioned that,

"Exposure to electronic records management should be increased among public servants before implementing the DDMS. Otherwise, the DDMS implementation will fail if the public servants are reluctant to use it. The need to capture email records in the DDMS will not be understood, if the culture does not exist. "

Arguably, good record keeping should be mandatory in managing email records and to avoid the risk of records in the public sector being lost. Then, the management of compliance and the governance of email record keeping in the Malaysia Government would be sufficient to ensure that there is a consistency in the implementation of email record keeping. Consistency would be created among public servants in the whole Malaysian Government.

In managing email records and to ensure that the DDMS system would be accepted and implemented by the whole public sector, the Malaysian Government should perhaps have conducted a change management programme before the DDMS was implemented, rather than after implementation. The change management programme could have created awareness and improved the DDMS and email record keeping in the Ministry.

5.10 Conclusion

According to the law in the *National Archives Act 2003* (Malaysian Government, 2003) and the national guidelines *Managing Public Office Records* (National Archives of Malaysia, 2016), emails have been accepted as records and evidence by the Malaysian Government. The DDMS has been developed to ensure that government emails and other electronic records are managed according to the international standards embodied in ISO 16175:2 (2011), which has been adopted nationally as MS ISO 16175:2 (2012). To support its implementation, MAMPU developed policies and guidelines related to email record keeping and in particular the *DDMS Manual* (MAMPU, 2014).

At the time of the data collection of this study, the DDMS had not been implemented across the whole of government, including by all government agencies. Less than 24% of departments and agencies had adopted the system. Adoption varied within the Ministry studied, with one department unable to adopt it due to it not fulfilling their business requirements in managing classified records. For the two departments that had adopted it, compliance with the system's guidelines in the *DDMS Manual* (MAMPU, 2014) also varied. One department was fully compliant, the other only partly compliant. The different levels of compliance were the result of people's preferences, the departmental information culture and the influence of senior staff.

The governance of the DDMS was the responsibility of MAMPU and not NAM, the body responsible for managing the records of the Malaysian Government, which is the core function of the DDMS. The development and implementation of this system was seen as an IT project rather than a project for business purposes, in this instance for the delivery of the better government of electronic record keeping. The present research findings raise questions about the preliminary system's functional requirements and the design of the DDMS, the wider non-functional requirements for successful information and records management, the implementation strategy, and the management of the overall project. These aspects are discussed in the next chapter.

CHAPTER SIX

DISCUSSION OF RESULTS

6.1 Introduction

The findings shows that email management in the Malaysian Government is based on the DDMS, a record keeping system developed by MAMPU and NAM to manage the government's electronic records. In designing the DDMS, the ISO 16175 (2010) was referenced. This study focused on email records management. The successful management of email records depends on the design, development and implementation of systems which meet both the functional and non-functional requirements for record keeping. This process involves different stakeholders with responsibility for ensuring that those requirements are met according to international standards.

6.2 Emails as Records

The nature of emails, as part of a dynamic electronic means of communication within a self-contained system, and their acceptance as records has been discussed across the world. Many practitioners with different skills and knowledge have discussed emails as records. The acceptance of emails as records in the government of Malaysia is based on the mandate from the *National Archives Act 2003* (Malaysian Government, 2003). Yet, not all government servants accept email as records. Senior employees who use paper records prefer and are more convinced of their utility. Respondent OP2D3 stated that one of the difficulties here is to change the perspective among senior employees according to which emails are not accepted as records. Effort from top management is needed to help change this perspective.

Email is an ICT tool that enables organisations in the private and public sector collaboratively to work, and it improves flexibility, interactivity, and the effectiveness of regulation (Ketelaar, 2007). Emails are acceptable as evidence if they can be presented as authentic records (Kerr, 2001). Email as records in the government sector has to comply with the principles for managing email records, such as those in the National Archives of Australia (2018), which declared that “emails created or received as part of Australian Government business are Commonwealth records and need to be managed

according to the Archives Act 1983". Another example is from the National Archives of the United Kingdom (n.d) concerning the management of government records, specifically for England and Wales, where public sector email are public records and subject to the Public Records Act (Great Britain, 1958), the Freedom of Information Act (Great Britain, 2000) and the Data Protection Act (Great Britain, 2018).

The acceptance of email as records in the Malaysian Government has been supported by circulars and guidelines specifying how to manage email, as has been mentioned previously.

In determining that emails are reliable records, various elements need to be considered by the user. According to the National Archives of Australia (2018), the user needs to identify whether or not their email messages received or sent are useful for business processes and appropriate to be captured in a system that is able to manage them properly. The National Archives of Australia list the questions which need to be answered by the user before saving an email in the record keeping system. Similar advice is given by the National Archives of United Kingdom (2018) for identifying the value of an email before retaining it in an appropriate system.

The National Archives of the United Kingdom emphasise that users should recognise the value of those email that are identified as records to ensure that they are captured in a proper record keeping system. As mentioned previously in Chapter Two, ISO 16175:2 (2011) states that a system used to manage records in a digital environment should be able to maintain the content, context, and structure of records in order to ensure that they can be accessed, retrieved and have value as evidence in business processes.

From a legal perspective, Mohamad Yunus (2006, p3)⁴ has discussed the status of email and electronic records in Malaysian courts.

⁴ A scholar from Law Faculty in the University of Malaysia.

“Nowadays, the court allows the use of email, SMS, digital-photography, Auto Teller Machine (ATM) transactions, internet usage networks, computer memory content, computer data support tools, computer-generated printed media, and digital video and audio files as evidence. The court has also found that the evidence from electronic and digital formats provides clear and detailed information. The material is difficult to destroy but easy to modify, copy and handle. The issues that are often disputed in court are regarding the authenticity, accuracy and security of the electronic and digital materials as evidence.”

Furthermore, prosecutors, attorneys, and investigators need to know how to handle electronic and digital materials (Mohamad Yunus, 2006).

The Government of Malaysia Vision 2020 needs electronic records to support e-government. With the aims in this vision, the level of awareness of electronic and digital records in the government sector specifically as used in court as evidence should be increased even though there are issues which arise related to the authenticity, accuracy and security of electronic and digital records as evidence.

In many legal systems in both developed and developing countries, electronic records are accepted as one of form of evidence rather than only a communication tool. Emails and any attachments created, received and used need to be protected if they are to be used as evidence in cases in court, according to legislation (Koopmann,2009),

The compliance of capturing email in a record keeping system is a part of an audit trail of electronic records. Authenticity and accuracy are vital in ensuring that emails can be accepted as evidence by the judicial system. To ensure that email records are accepted as evidence in business transactions or in court case, the systems used must ensure that the characteristics of authoritative records are supported (ISO 15489:1, 2016).

Interestingly, the DDMS does function as an audit trail that can provide evidence in business processes. It should, therefore, not be an issue that records in the DDMS can be accepted as evidence in Malaysian courts and their probative value assured. Perhaps because of a lack of trust in the email format that is naturally a born digital record, and a preference for paper records, there is uncertainty about emails as evidence in court, as Piasecki (1995) identified.

6.3 Records Management Theory

Although the records continuum model was used to develop the interview questions, the analysis found that the Malaysian Government referred to the records life cycle model to develop the DDMS as well as guidelines related to Electronic Records Management (ERM):

“The policies and guidelines developed by NAM are adopted from the life cycle records model. The continuum concept is more about managing electronic records. Actually, it is an extension of the life cycle. The organisation needs to understand the process of creating the records, and how the maintenance and archiving processes work. They need to apply records management if they want to dispose of the records and inform NAM. The government agencies only need to know the basic process until the records have been transferred to NAM or disposed of. They need to use software to dispose of the electronic records. However, the life cycle of electronic records in Malaysian Government is still incomplete. It is still new (2 years old). In my opinion, the life cycle model is sufficient for managing electronic records. The continuum concept is more about business processes.” (NAM1)

The preference for applying the records life cycle model, rather than the continuum model in managing electronic records in the Malaysian Government, needs to be considered. If the records continuum model were used it would help to focus on access to information. Approaching the records continuum from the outside in (i.e. the fourth dimension pluralise) would enable them to first consider the social and cultural dimensions. This would ensure that “records are able to be reviewed, accessed and analysed beyond the organisation, for the multiple external accountability, historical, cross organisational purposes that are required, for as long as they are required” (Reed. 2005, p19-20). Hence, it would help the management of email address the Right to Know and Freedom of Information Enactments (FOIE), currently only enacted in Selangor and Penang, by making it easier to find records and make them available.

The records continuum model is more advantageous for electronic records management because it emphasises on:

“similarities rather than differences, qualities and quantities rather than quantities alone, positive and cohesive ways of thinking rather than disparate or passive ways, integrated policy making rather than fragmented frameworks, integrated control of policy implementation rather than separate control and integrated rather than disparate approaches to problem solving, and meeting customers’ needs through collaboration rather than by duplication and overlap.” (An, 2003, p.28)

The continuum model is more appropriate for the management of electronic records because it extends what is offered by the records life cycle model (Flynn, 2001). The use of the continuum model could improve the implementation of the DDMS as it is ideal for integrating the activities of end-users (public servants), records officers, archivists, system developers and policymakers (NAM and MAMPU) because it represents “a graphical tool for framing issues about the relationship between records managers and archivists, past, present, and future, and for thinking strategically about working collaboratively and building partnerships with other stakeholders” (McKemmish, 1997, p1).

Emails are dynamic records. For example, they can be added to, altered and copied, and are easier to detect unauthorised activities in paper based records. Thus, email needs to be managed using the records continuum model. The continuum model, rather than the life cycle, is appropriate to manage classified records by applying the dimensions and axes presented in the model. These improve transparency in decision-making by providing information to the users and stakeholders of any action taken with the records. Thus, the adoption of this concept in the DDMS should be considered to ensure that email records are suitable for an electronic environment that is rapidly changing with the emergence of technology. The Malaysian Government has also implemented a hybrid record keeping system by introducing a centralised registry to support their email management.

6.4 Implementation of Registry and Hybrid Record Keeping Systems

The Ministry of Communication and Multimedia Malaysia is using a hybrid record keeping system for business activities. The concept of a hybrid record keeping system in the Malaysian Government is to implement a centralised registry (paper based record keeping system) and the DDMS (electronic record keeping system). Centralised and decentralised registries are implemented where both are used in managing different types of records, which are open access and confidential types of records respectively. The centralised registry acts as a repository to store physical files and contains printed email records for the DDMS. This practice is similar to that discussed

by Tough and Lihoma (2012) regarding registries in the government sector, where an integrated record keeping system is shared in the form of two: open and confidential registries.

The Malaysian Government decided to implement a hybrid record keeping system in which digital records are partially replicated on paper by printing the first page, thus acting as a partial back-up. The reason for printing the first page, instead of the whole document, is to support paperless e-government. This practice of printing email records and filing them in the centralised registry is not simple for the Ministry since the process needs to be done manually. The main purpose of an electronic record keeping system is to help users in completing their business processes and not burden them with manual tasks such as printing and filing. However, this practice seems impractical since they can support paperless by implementing an electronic record keeping system rather than a hybrid system. Paper records content should provide information relates to the electronic records by using metadata as a link. For instance, if the DDMS cannot be used due to system failure, paper records which are copies of electronic records in the DDMS can be referred to at the centralised registry. However, this concept is contradicted with a definition of hybrid record keeping system in ISO 16175:2 (2011, p11), which defines it as “a record keeping system containing a combination of paper, digital or other formats”.

A hybrid record keeping system comprises records in paper, electronic or other formats (National Archives of Australia, 2016). According to Howard (2002), the power of a hybrid records keeping system lies in the complex interaction between the intellectual and physical control of records. In a hybrid record keeping system, it is significant that a link is created between a physical record and an electronic record. Both physical and electronic records need to contain unique metadata to ensure that both records are related. According to Howard (2002),

“Hybrid record keeping systems give a single point of access, and a single index, facilitating cross-media information retrieval. It reduces the duplication of effort to ensure that consistent classification, security, access controls, and retention policies are applied across the board. They are all records that need to be consistently managed, and we need to look at the way that we try to organise them using folders and files, and use a common vocabulary to describe them.”

In the Malaysian Government, the transition from decentralised paper registries to a centralised registry was designed to provide a standard records management procedure to ensure that records are managed according to the guidelines in *Managing Public Office Records* (National Archives of Malaysia, 2016), the *DDMS Manual* (MAMPU, 2014) and other relevant policies and guidelines given by the NAM and MAMPU. PIC1D1 gave an overview of the decentralised registry before the implementation of the centralised registry.

“The centralised registry in the ministry started in 2015. Before that, there was no authentic registry. The decentralised registries have been implemented and a person in charge is not an expert in records and archives management. Every unit and department has its own registry. The decentralised registries are using a file classification scheme by the NAM. The centralised registry was launched on the same date as the DDMS. “

PIC1D1 described one of the differences between the centralised and decentralised registries. The centralised registry is monitored by an RO who has a background in records and archives management and was trained by the NAM. However, the decentralised registries are monitored by staff in specific units or departments without any records management and archives background even though they received some record keeping training from the NAM.

The decentralised registries have advantages since they only hold the division's or unit's records. The process used to access the records is more efficient, since the registry is located in the same area as the division or unit. Each of the divisions and units has their own decentralised registries used to store paper records. Decentralised registries control their own recording functions and do not recognise common interests across the field, resulting in the duplication of information and records (Craig, 2004). However, in the Ministry, the security types of records have been identified as open, classified, confidential, secret and top secret, they will be classified according to their file classification scheme where both registries are using the same scheme. Thus, this helps avoid duplication as stated by Craig (2004).

However, in comparing centralised and decentralised registries, PIC1D2 maintained that the latter are more convenient because the records are

located near to the users, who are the division's or unit's employees. The centralised hybrid registry provides storage for paper records and ensures the details are the same as those in the DDMS system. It is crucial to secure the contents of the records, and especially for classified records, and most organisations are hesitating to use electronic records. As discussed by Tough and Moss (2006), since sensitive documents will typically include some of the most business-critical information, clearly a solution that omits this material will damage the integrity of the records. Sometimes, this may be unavoidable and may have to be dealt with in a hybrid solution. In the Malaysian Government, the hybrid record keeping system was initiated on the first day that the DDMS was launched. The implementation of the DDMS and a centralised registry are based on the awareness of record keeping system and link by developing a hybrid record keeping system. MAMPU2 stated that,

“The Malaysian Government is using a hybrid record keeping system even though we are heading towards paperless government. The implementation of paperless government is gradual. The court still requests physical records as evidence. The DDMS is a hybrid record keeping system where the first page of an email record needs to be printed and filed in a centralised registry. The previous practice was that all of the pages of an email, including attachments need to be printed and this required more filing space.”

The advantage of the centralised registry has been identified by PIC1D1. In comparison with decentralised registries, PIC1D1 believed that the DDMS improved efficiency in managing electronic records.

However, although the centralised registry is implemented in the Malaysian Government, decentralised registries are still used as mail or file rooms in every unit or department. The function of the decentralised registry is to manage classified records held in that unit or department. The management of the decentralised registry complies with the principles and file classification scheme issues by the NAM. Record assistants in the units or departments run the decentralised registries. The decentralised registry practices in the ministry follow no specific standards even though the record assistant receive training in records and file management from NAM. The management of the decentralised registry may comply with the principles issued by NAM, but practice depends on preferences in the specific unit or department.

According to Craig (2004), records are rarely managed according to rules, and personal preferences rather than procedures are influential in the decentralised registries. The decentralised registries may provide different work scopes but the services and functions are similar according to the procedures and principles. The concept of a centralised hybrid registry needs to be understood by users to support the management of change and the implementation of the DDMS in the Malaysian Government.

The DDMS is a centralised electronic record keeping system since; it operates by MAMPU and acts as a central repository for records in the Malaysian Government. The initiative to ensure the efficiency of record keeping systems in the Malaysian Government and to hold all electronic records in the same repository is a great challenge unless users have been prepared with sufficient skills to implement the system.

The registries in the Malaysian Government are based on the same file classification scheme which is provided by the NAM. However, it might be better if the management of the decentralised registries was led by RO assisted by record assistants. This is because the consistency of procedures followed in managing the decentralised registries could be improved if they were governed by the same level of authorised staff. Craig (2004) stated that decentralised registries in the government sector lead to the duplication of records, but this could be improved if standardised record keeping was implemented. The hybrid record keeping system used in the Malaysian Government does not match the definition in ISO16175: 2 (2011, p11) that, both electronic and paper records rather than replicating each other.

6.5 Guiding Principles and Functional Requirements for Digital Records Management Systems

ISO 16175:1 (2010) was developed from the International Council on Archives and the Australasian Digital Recordkeeping Initiatives Principles and Functional Requirements for Records in Electronic Office Environments. The Malaysian Government introduced the DDMS as a system to manage records in the electronic environment, referring to ISO 16175:2 (2011). In order to conduct an accurate analysis of the data collected, the findings of this study are discussed in terms of the functional requirements in MS ISO 16175 (2012), which is the Malaysian government's adoption of ISO 16175 (2010). It should be noted that ISO 16175 is under review (International Organization for Standardization, n.d); but this is not scheduled for publication until 2020⁵. It was not possible to assess the DDMS against all 275 functional requirements in ISO 16175:2 (2011) because permission was not given access to the DDMS requirements specification due to confidentiality and security issues. Therefore, an assessment was made against the records and systems related principles, and the functional requirements specifically relating to email. In the context of system design, a functional requirement is defined as a system requirement; while non-functional requirements are "not behavioural in nature but are constraints on system development and implementation, for instance relating to system usability" (Maciaszek, 2007, p80). As stated by Ulbert (2014), system requirements specify the system's capability, functioning and properties. Information about system requirements can be identified using many techniques that involve users.

To assess the degree to which the requirements are met, the results are presented in Tables 17, 18 and 19. The assessment scale is based on narrative scales amended from the System Usability Scale created in 1986 by John Brooke (Brooke, 1994). It is a five point Likert scale indicating the degree to which the content of the statement was met – either exceeded, fully met, met, partly met and not met -.This five point scale was used in preference to the five point scale in the sample checklist in ISO 16175: 2 (2011, p68-69) for two reasons. The latter does not explicitly describe all points on the scale and does not allow for a

⁵ Personal communication with a member of the ISO/TC 46/SC11 committee responsible for ISO 16175.

requirement to be exceeded. Thus, this scale was used to determine the degree to which the requirement is met.

6.5.1 Records Related Principles for Business Information Systems

ISO 16175:1 (2010) identifies four records-related principles that should be followed by the organisation in order to drive system development and implementation. Table 17 summarises the degree to which the DDMS meets these requirements.

Requirement	Degree to which the requirement is met				
	Exceeded	Fully met	Met	Partly met	Not met
1. Electronic business information has to be actively managed and reliably maintained as authentic evidence of business activity.				X	
2. Business information has to be linked to its business context through the use of metadata.				X	
3. Business information has to be kept and must remain accessible to authorised users for as long as required.				X	
4. Business information has to be able to be disposed of in a managed, systematic and auditable way.				X	

Table 17: Assessment of the DDMS against Records –related Principles in ISO 16175:1 (2010)

The DDMS partly meets the first records-related principle, which is the functional requirement to actively manage electronic business information, such as email records, to ensure that they are reliably maintained as authentic evidence of business activities. However, although one of the DDMS functions is to ensure that electronic records serve as evidence in business transactions, it is not the only evidence of specific transactions or decisions. The *DDMS Manual in the Ministry of Communication and Multimedia* (Ministry of Communication and Multimedia Malaysia, 2016) declares that email records need to be printed and filed in a centralised registry. In the hybrid record keeping system, the electronic record acts as

evidence, with paper records as a support (as mentioned in section 6.4). This practice is based on an instruction from the National Archives of Malaysia (2010, pg.6) that, “a copy of email (including attachment) requires printing and filing in a physical file if the organisation is implementing a hybrid record keeping system”. This contradicts the ISO 16175 requirement that electronic records should serve as the only evidence of specific transactions or decisions. Since, a paper record is a copy of email record in the DDMS, this Ministry practices the acceptance of both electronic and paper as evidence even if it is born digital. However, the National Archives of Malaysia (n.d, p.12) states that, “printing email record is an exceptional to the email record that has a high priority to the organisation business transactions”. This concept is most relevant to the decentralised registries, since they manage confidential and high-priority records.

The functional requirements in ISO 16175:2 (2011) states that the management of an information system should be able to maintain the content, context, structure and links among records to ensure that they can be accessed, retrieved and have value as evidence in business processes. Thus, the Malaysian Government should consider retaining electronic records as strong and primary evidence of business activity instead of accepting them as supporting evidence in paper records.

The second records-related principle states that business information has to be linked to its business context through the use of metadata. The DDMS should be able to link business information in email records to the business context by identifying, authenticating and contextualising records and the people, processes and systems that create, manage, maintain and use them, and the policies that govern them. Thus, the DDMS only partly meets this requirement, since the Ministry has not implemented consistent rules about capturing metadata manually even though there are guidelines in the *DDMS Manual* (MAMPU, 2014).

The Ministry implements two methods of capturing metadata: auto-capture for the sender email address, date and time of the email record, and manual capture using file numbering by the person who creates or captures the records. ISO 16175:1 (2010, p5) states that “in order for information to have the capability of functioning as a record, it is necessary to augment that information with metadata that places it in the context of the business

operations and computing environment in which it was created". This context is derived from the system and its documentation to make sure it standardised in use. Metadata is a main component in hybrid record keeping that is used to link a paper record in the centralised registry to an email record in the DDMS.

Manually assigning metadata is a great challenge, because the user needs to employ an appropriate description to link the records with business activities. Failure and inconsistency in capturing metadata can create inaccurate information about the records and may mean that it cannot be retrieved from the system. However, the RO is responsible for correcting the metadata in the DDMS. This is supported by the guidelines from the National Archives of Malaysia (2013) and, if an error is discovered within the metadata of records, the user needs to make a request to the RO for the error to be corrected immediately. The National Archives of Malaysia explains the need for capturing metadata in the electronic record keeping system (National Archives of Malaysia, n.d; 2015) and provides a list of metadata for each type of records in the DDMS, including email (National Archives of Malaysia, 2013). ISO 23081:1 (2017) states that the records management metadata can be inherited or extracted from business systems, including email systems, and the DDMS fulfils this requirement by extracting auto-captured metadata from the email system. However, the DDMS should be able to help in the process of manual capture so that accurate metadata is able to support business and records management processes, and the DDMS should protect records as evidence and ensure their accessibility and usability through time (ISO 23081:1, 2017).

The third records-related requirement is to ensure that business information is kept and remains accessible to authorised users for as long as required. The guidelines provided by NAM mentioned the capability of electronic record keeping system in maintaining records that born digital (National Archives of Malaysia, 2010; 2013). The DDMS only partly meets the requirements because the practice of capturing email records in the DDMS by the Ministry is not fully compliant with factors such as people's preference for paper records. The system is also not fit for a department's business activities and this contradicts the guidelines (National Archives of Malaysia, 2013). The system has been prepared to keep and maintain email records,

but its implementation has not met these objectives since the system is unable to manage confidential records and users prefer to use a paper based record keeping system. However, the ISO standard (ISO 16175:1, 2010) does not provide specifications for the long-term preservation of digital records, since it focuses on the creation and management of electronic records. As mentioned in the standard, issues of preservation or digital archiving need to be addressed in a separate framework (ISO 16175:2, 2011):

“Digital preservation considerations transcend the life of systems and are system-independent; they need to be assessed in a specific migration and conversion plan at the tactical level. However, recognition of the need to maintain records for as long as they are required is addressed in ISO 16175-2:2010, and potential format obsolescence issues need to be considered when applying the functional requirements” (ISO 16175:2, 2011, p1).

The DDMS should be able to fulfil the requirement to dispose of records according to the functional requirements of electronic records. Even though the email record has not approaching their disposal period in the Malaysian Government, the DDMS still provides a retention schedule for their disposition. The DDMS partly meets the records-related fourth requirement which is that business information has to be able to be disposed of in a managed, systematic and auditable way. The DDMS complies with the *National Archives Act 2003* (Malaysian Government, 2003). Email records in the government sector need to be disposed of according to the legislation and the rules specified in Section 27 of the National Archives Act 2003 (National Archives of Malaysia, 2011).

The DDMS needs to be able to dispose of records in a systematic, auditable and accountable way in line with operational and juridical requirements. It should provide a retention schedule for records and the appropriate action dates. According to ISO 16175:1 (2010), organisations need to comply with the policies and procedures of their local jurisdictional authority for identifying, retaining and disposing of records. Appropriate guidance on email record retention and disposition should be generated by the DDMS based on the relevant policies and guidelines. The procedure for disposing of email records in the DDMS is conducted by the RO and approved by NAM before action is taken (National Archives of Malaysia, 2013). The DDMS should operate in accordance with the records-related principles in ISO

16175:1 (2010) to that ensure the system is able to make, keep and use authentic evidence (that is, records) of business activity to meet their business needs and legal obligations.

6.5.2 Functional Requirements for Email

Table 18 presents an assessment of the DDMS in terms of the email requirements from ISO 16175:2 (2011) to show the DDMS' capability in fulfilling the functional requirements in the standard. Data on the capability of the DDMS is based on information from the *DDMS Manual* (MAMPU, 2014) (see section 5.7). Although both MAMPU (2014) and NAM (2013) stated that the DDMS refers to the ISO standard, the system does not yet fully meet the requirements for email management.

Requirements	Degree to which the requirement is met				
	Exceeded	Fully met	Met	Partly met	Not met
1. Allow users to capture emails (text and attachments) as single records as well as individual records linked by metadata.			X		
2. Allow individual users to capture email messages (and attachments) from within their email application.			X		
3. Allow users to choose whether to capture emails with attachments as: <ul style="list-style-type: none"> • email text only; • email text with attachments; or • attachments only 				X	
4. Ensure the capture of email transmission data as metadata persistently linked to the email record.				X	
5. Ensure that the text of an email and its transmission details cannot be amended in any way once the email has been captured. Nor should the subject line of the email itself be changeable, although the title of the record may be edited for easier access through, for example, keywords or by file-naming conventions.			X		
6. Ensure that a human-readable version of an email message address is also captured, where one exists.			X		

Table 18: Assessment of the DDMS against Email Capture Capabilities in ISO 16175:2 (2011).

The first capability is that the DDMS should “allow users to capture email text and attachments as single records and as individual records linked by metadata” (ISO 16175:2, p36). The organisation should provide users with the capability of capturing both selected emails and attachments. Six email capture capabilities are stated in ISO16175:2 (2011). The DDMS meets this requirement (see Figure 6, section 5.7.2.1). Emails are captured and linked using metadata and cannot be altered.

The second capability of the DDMS that has met the requirement is to “allow individual users to capture email messages and attachments from within their email application” (ISO 16175:2, p36). This finding was presented in Figures 9 and 10 (section 5.7.2.1).

The third requirement is to “allow users to choose whether to capture emails with attachments as email text only, email text with attachments or attachments only” (ISO 16175:2, p36). The DDMS partly meets this requirement. An email that has an attachment will be auto-captured (see Figure 11, section 5.7.2.1). The email and attachment cannot be captured separately as the system uses auto-capture. The DDMS could be improved and more user-friendly if the third requirement was fully met.

In ISO 16175:2 (2011) the fourth requirement, which is partly met by the DDMS, is to “ensure the capture of email transmission data as metadata consistently linked to the email record” (ISO 16175:2, p37). The discussions about capturing metadata in the DDMS were similar to those about records-related policy (section 6.5.1) and system-related policy (section 6.5.3).

The fifth requirement for email capture in ISO 16175:2 (2011) is to “ensure that the text of an email and its transmission details cannot be amended in any way once the email has been captured. The subject line of the email itself should be changeable, although the title of the record may be edited for easier access through, for example, keywords or by file-naming conventions” (ISO 16175:2, p37). The DDMS meets this requirement based on data shown in Figures 11 and Figure 15 (both in section 5.7.2.1).

The sixth requirement is that the DDMS should “ensure that a human-readable version of an email message address is also captured, where one

exists” (ISO 16175:2, 2011, p37). The DDMS has met this requirement, as seen in Figure 11 (section 5.7.2).

Table 18, the DDMS partly meets the functional requirements in terms of managing email records even though the system is not fully compliant with ISO 16175:2 (2011) in terms of the functional requirements for digital records management systems. MAMPU and NAM might have only considered the functional requirements from ISO 16175 and could have neglected user requirements in the system’s design. Functional testing with a potential user could have helped to configure the system to fully meet the requirements.

6.5.3 System-related Principles for Business Information Systems

MAMPU was responsible for developing the system and analysing whether or not its system design fit the requirements of the government’s business activities based on the ISO 16175:1 (2010). The latter identifies eight systems-related principles that should be met in the development and implementation of record keeping system. Table 19 presents an assessment of the degree to which the DDMS meets those requirements based on the findings.

The *DDMS Manual* (MAMPU, 2014) is used to inform users about the system’s functions and capabilities in managing records. The capabilities of the DDMS are discussed in section 6.6.7.

The first principle is that “systems should support good business information management as an organic part of the business process. Although it is not necessarily appreciated as such, good records management practices are an integral part of any business process. When automating business process, one should always evaluate the advisability of the simultaneous integration of records management software” (ISO16175:1, 2010, p6). The DDMS partly meets the requirements, since the Ministry uses the DDMS in creating and capturing records for business processes. However, these practices are only partly implemented by staff due to various factors.

Requirements	Degree to which the requirement is met				
	Exceeded	Fully met	Met	Partly met	Not met
1. Systems should support good business information management as an organic part of the business process.				X	
2. Systems for capturing and managing business information have to rely on standardised metadata as an active, dynamic and integral part of the record keeping process.				X	
3. Systems have to ensure interoperability across platforms and domains and over time.			X		
4. Systems should rely as far as possible on open standards and technological neutrality.					X
5. Systems should have the capacity for bulk import and export using open formats.					X
6. Systems must maintain business information in a secure environment.				X	
7. As much metadata as possible should be system generated.				X	
8. It should be as easy as possible for users to create/capture records of business activity.			X		

Table 19: Assessment of the DDMS against Systems–related Principles in ISO 16175:1 (2010)

The second principle is that “systems for capturing and managing business information should rely on standardised metadata as an active, dynamic and integral part of the record keeping process” (ISO 16175:1, 2010, p6). The DDMS partly meets this requirement since users are able to capture metadata manually or it is auto-captured by the system. However, there are no particular guidelines or manuals to guide users and thus less standardised manually captured metadata is created. Accurate metadata helps the use of email records as evidence in the DDMS over their lifespan and in other technological platforms. ISO 16175:1 (2010, p6) states that “automated solutions for records offer powerful capabilities to access and attach standardised contextual information using standardised vocabularies

and taxonomies to record content at different times during the life of the record". Thus, this principle should drive the organisation to maintain their digital records and ensure that they are able to be understood can be migrated to other formats if necessary for long lasting requirement.

The third requirement in the ISO 16175:1 (2010) systems-related principles is that the system should ensure interoperability across platforms and domains and over time. The DDMS meets this requirement since it provides for the migration of the records from the DDMS Version 1.0 to the DDMS Version 2.0 (RO). Records from the DDMS have been migrated since the system was upgraded to version 2.0. Thus, records from version 1.0 still can be accessed in the latest version to continuously support Ministry work processes. ISO 16175:1 (2010, p6) states that "digital evidence, in the form of records, often has operational or juridical requirements for persistence over periods of time that may exceed the lifespan of the hardware or software that created it. "As such, record information must be able to be presented in a manner that is understood and able to be modified, if necessary, for migration to other technology platforms" (ISO 16175:1, 2010, p6).

The fourth principle is that "systems should rely as far as possible on open standards and technological neutrality" (ISO 16175:1, 2010, p6). However, the DDMS was built by a vendor and MAMPU and did not use an open standard. Thus, the DDMS does not meet this requirement. ISO 16175:1 (2011) states that "hardware or software dependencies can have adverse effects on the access and preservation of records material in the long term. Use of open standards ameliorates these technological dependencies" " (ISO 16175:1, 2010, p6).

The DDMS does not meet the fifth principle that "systems should have the capacity for bulk import and export using open formats. Records software should ideally incorporate capabilities to remove these dependencies via support for bulk re-formatting as part of import or export capability or, at a minimum, via the non-proprietary encoding of record metadata" (ISO16175:1, 2011, p6-7). Import and export of records using open formats is not a requirements listed in the *DDMS Manual* (MAMPU, 2014).

The sixth principle that systems must provide a secure environment for the records held (ISO 16175:1, 2010). The DDMS partly meets this requirement because unauthorised activity or alterations to records will be detected by an audit trail that is able to recognise any changes, duplications or losses in a file (RO). However, since the RO is allowed to open the records in the DDMS, that are restricted access to other staff, in order to explain the contents of records to them, the integrity of the records may be comprised even if no alteration has been made. A good electronic record keeping system should be able to support all types of records by providing a high level of security. A record keeping system “must not allow unauthorised modifications to any records (including metadata), and where authorised modifications are performed, they must be fully documented” (ISO 16175:1, 2010, p7). The system needs to be managed in compliance with any relevant printed documentation such as policies, manuals, and guidelines. The records from business transactions in the organisation need to be managed by the record keeping systems and it should be ensured that records cannot be altered or deleted before the disposal date. The record keeping system should allow records to be accessed by users across time and space.

If the record keeping system is designed according to the principles in ISO16175 this should help to simplify records of business activities. The seventh assessment principle is that as much metadata as possible should be generated by the system. “Users are typically unwilling to interrupt their workflow more than three times in the accomplishment of ancillary tasks executing the primary activity. It may be impractical and/or unnecessary to expect end-users to supply much metadata. Systems should be designed and implemented in a manner that allows the automatic population of record metadata fields” (ISO 16175:1, 2010, p7). However, some metadata is intended to be captured manually in the DDMS in order to ensure the accuracy of the records. For instance, the relevant file classification scheme needs to be decided by the user based on the email content. Thus, the DDMS partly meets this requirement, since the list of metadata required is provided from the metadata options in the *DDMS Manual* (MAMPU, 2014). The auto-captured or default metadata helps users to work more efficiently than if it is manually captured.

The final assessment for system-related principle is that it should be as easy as possible for users to create or capture records of business activities. When using the DDMS it is possible to create and capture records based on six different scenarios (MAMPU, 2014). Unfortunately, even though the system provides the end-user with several options for email creation and capture, certain people in the Ministry still refuse to implement the DDMS, as they state that capturing email records in the system is impractical compared with capturing them on paper. Their preference influences this issue. The DDMS meets this requirement by providing complete information to users on creating and capturing records of business activities in the *DDMS Manual* (MAMPU, 2014).

Because the issues associated with records and archives management are closely linked to the system's design and the establishment of new information policies, MAMPU and NAM should refer to the principles for records and system from ISO 16175:1 (2010) to ensure that the system meets business needs and legal obligations. In summary, despite using ISO 16175:1 (2010) and ISO 16175:2 (2011) as reference while developing the system, the DDMS only partly meets or meets six of the system-related requirements, and does not meet two of them. The system would be better and more successful if the implementation requirements for successful electronic recordkeeping systems had been more carefully considered and a preliminary analysis had been conducted before its development. The system would then be more closely aligned with the Ministry's work processes.

6.6 Implementation Requirements of Successful Digital Business Information Management

The process of implementing the DDMS as a record keeping system in the Malaysian Government is dynamic since it involves many stakeholders and dynamic environments. To ensure that the system meets its objectives and is successful requires a focus not only on system design but also other successful components as stated in ISO 16175: 1 (2010). Based on the findings, there are various issues related to the system's implementation which affect its compliance. Table 20 presents an assessment of the degree to which the components of a successful system were met.

Component	Degree to which the components are met				
	Exceeded	Fully met	Met	Partly met	Not met
Policy frameworks					X
Business process analysis				X	
Project management				X	
Change management.				X	
Risk management					X
Sustainability				X	
Capability development				X	
Quality management				X	
Configuration management				X	
Corporate culture				X	

Table 20: Components of Successful Digital Business Information Management (ISO 16175:1, 2010)

6.6.1 Policy Frameworks

The two core aspects of records management and the information system are considered in formulating guidelines to drive the operation of the DDMS in the Malaysian Government involving NAM and MAMPU.

During the implementation of the DDMS, the only guidelines provided were the *DDMS Manual* (MAMPU, 2014). However, this manual is related to technical aspects of managing email records in the DDMS, for instance guiding users in creating, capturing and organising records in the system. In terms of records management, NAM has developed certain sets of guidelines related to email records management, which are *The Guidelines of Managing and Preserving Email for Public Sector* (National Archives of Malaysia, 2010, edited 2015); *Managing Electronic Records in the DDMS* guideline, (National Archives of Malaysia, 2013); *Electronic Records Management Systems: System Specifications For Public Offices, Version 3* (National Archives of Malaysia, 2011)⁶; and *Managing Electronic Records in an Unstructured Environment* (National Archives of Malaysia, n.d). These guidelines were designed before the implementation of the DDMS. Among the guidelines, the content of *Electronic Records Management Systems: System Specifications for Public Offices Version 3* (2011) is mostly similar to the text of the ISO16175:2 (2011).

⁶ Versions 1 and 2 are not available on NAM website

In ISO 16175:1 (2010, p7), it is stated that “it is necessary to conduct an analysis of existing information management and security policies and laws to address areas where policy revisions may need to occur due to gaps in software capabilities in deploying software with records functionality”. Thus, the existing or related policies and guidelines need to be analysed to ensure that they fit the functional requirements of the ISO 16175 and the system’s capabilities. The findings highlight that there are issues in revising MAMPU and NAM’s existing policies and guidelines. As mentioned in the Chapter 5 by MAMPU1:

“A policy takes five years to review. The process of review takes some time and it is a complex procedure. There are a lot of policies that have not been reviewed and need to be repealed.”

The future and successful management of email records in the organisation relies on the principles that inform and drive the email record keeping system in order to fulfil the recording of business activities. Following the policies and guidelines concerning the management of email is vital to ensure that email records are well managed and archived in the record keeping system.

The National Archives Act 2003 states that the content of policies and guidelines need to ensure that email records can be accepted as evidence of business activities and have to be preserved (Malaysian Government, 2003). Email is used actively as a communication medium in the government sector and most of the time the subject is only focusing in one particular subject. However, they could have multiple subjects in one letter. Thus, the policies and guidelines used in managing email should be of concern to the government as emails are also accepted as evidence of transactions.

The policies and guidelines that are related to the email management have not been revised and the existing guidelines are not implemented even the contents were relevant to the implementation of the DDMS in the Ministry, thus it does not meet the requirements. One of the barriers to implementing government (MAMPU and NAM) policies and guidelines is a lack of awareness among staff about the management of record keeping (Personal communication, 2016). Some of the employees thought that managing records was a minor part of office management. However, ISO 16175:2 (2011) states that one of the purposes of records management is to support the business needs of an organisation. It assists in improving the

effectiveness and efficiency of business activities. Good office management requires effective and efficient records management so as to “demonstrate to employees that managing records is important to the organisation by providing a framework to support their management of documents concerning business processes. Records management is a cornerstone of effective organisational management” (National Archives of United Kingdom, 2010, p3). The relationship between office management and records management can be understood based on the following statement given by the National Archives of the United Kingdom (2010, p4) that,

“There should be an explanation of the relationship between records management and the overall business strategy; for example by reciting that information is an asset considered vital to the work of the organisation.”

Unfortunately, these guidelines have been ignored in the Ministry, since none of the participants mentioned them. Limited promotion by NAM has doubtless influenced the lack of awareness of these particular guidelines. Perhaps, NAM could actively promote their electronic records management guidelines to the Malaysian Government, since their contents refers to the ISO Records Management standards in ISO 15489 and ISO 16175. Instead of promoting the guidelines on NAM website, an RO in each ministry may encourage staff in their ministry to implement the electronic records management guidelines in managing their business records. In order to improve governance and compliance with the guidelines, NAM and MAMPU could prepare a single integrated set of guidelines that combines aspects of both records management and the DDMS. This may improve consistency in terms of the principles used and the practices in managing email records in the Malaysian Government. As mentioned by Duranti (2010), the most important thing is to ensure that the policies, strategies and standards are consistent with one another, and this is only possible when they are based on the same concepts and inspired by the same principles.

The production, dissemination and implementation of policies and guidelines need to be very strongly incorporated by their designers and implementers. The purpose of developing policies and guidelines is to have a practical impact in the real world. In order to implement policies and guidelines, training should be provided. To ensure that the outcomes of policy development process are working and are effective, some means of measuring their impact and compliance are necessary. Part of the policy

development process is the derivation of qualitative or quantitative performance measures which can be applied to indicate the degree of compliance in existing records handling. From this a remedial strategy should be applied where a gap is identified between policy and application.

The National Archives of Malaysia (2010, p1) emphasise that, with the aim of identifying email as records, the process used must comply with the principles of email management:

“Email is like all other government records. It is classified as records according to the requirements of laws and regulations such as Security Regulations and the National Archives Act 2003 and supporting policies and standards.” (National Archives of Malaysia, 2010)

Allan (2015, p1) concluded that “good record management, whether of paper or digital records, is essential for good government: to support policy development, to provide accountability, to enable comprehensive evidence to be submitted to inquiries and court actions, and eventually to provide the historical background to government” The policy is developed as a cornerstone to the record keeping implementation. Emails are not protected as assets unless copyrightable or protected by other legal principles, such as those enshrined in guidelines and policies (Harbinja, 2016). The issue of the ownership of email content in the organisation is less since the terms and legal regulations mention that email records belong to the organisation. In the Malaysian Government, the principles for managing email are provided by NAM and MAMPU.

MAMPU¹ briefly explained the list of principles they referred to in developing and implementing the ERMS or record keeping system. These policies and guidelines are contained in 1) the *National Archives Act 2003 (Act 629)* (Malaysian Government, 2003); 2) *MS ISO 16175: Information and documentation - Principles and functional requirements for records in electronic office environment* (Department of Standards Malaysia, 2012) ; 3) *MS 2223-1: 2009: Information and Documentation - Records Management - Part 1: General (ISO 15489-1: 2001)* (Department of Standards Malaysia, 2009); 4) *MS 2223-2: 2009: Information and Documentation - Records Management - Part 2: Guidelines* (Department of Standards Malaysia, 2009); and 5) *Circular No. 5 Year 2007: Guidelines for Office Management* (Malaysian Government, 2007).

In the preliminary data collection process, the present research found a number of circulars and guidelines related to managing email in the Malaysian Government (Chapter Two were identified). One of the sets of guidelines, *The Guidelines for Managing Electronic Records in the Unstructured Environment* by NAM (National Archives of Malaysia (n.d), emphasises email as records in the government sector. The purpose of these guidelines is to provide specific guidance to records managers, information system practitioners, registry staff and email users on the management of electronic records. The guidelines contain two sections. Section one is the most relevant to this research topic, entitled *Guidelines on the Management of Email* and section two concerns *Managing Shared Directories*. However, these guidelines focus on printed email records. The guidelines state that government agencies should adopt a 'print-and-file' approach to ensure that emails records and their status are captured and preserved properly in an appropriate record keeping system. (These guidelines were published before the implementation of the DDMS). The Government of Malaysia has the right to access all emails sent or received via the government email system provided in the government domain and managed by MAMPU (National Archives of Malaysia, n.d). Based on the findings of this research users have not been notified of this guidance. Furthermore, the guidelines are out-of-date since they were published before the implementation of the DDMS. In practice, the Malaysian Government is using a hybrid record keeping system for managing email, which combines the DDMS for electronic records and the print-and-file method for paper based records. This practice is not in accordance with one of its benchmarking countries' approaches. The Australian Government's policy clear states that digital information should be managed in digital form and that emails should not be printed and stored in (paper) files.

The policy identifies a range of systems that can be used to manage email, including an EDRMS and case management system. It goes on to say:

"If your organisation doesn't have a more suitable system, it's better to store your business email in a network or shared drive system than leave it in an email system. Your information will at least be available to other staff to use and it can be stored in context. However, information in shared drives can be altered or deleted without authorisation so this should only be a temporary solution" (National Archives of Australia, 2018).

The issue in the Malaysian Government is that the most important principles were either unrecognised or opposed by public servants even when related to email management. The only principles known by public servants in relation to managing email are the DDMS Manual from MAMPU (2014). NAM has published policies and guidelines related to email management in *Electronic Records Management in an Unstructured Environment* (National Archives of Malaysia, n.d) and *Guidelines on Email Management and Preservation in the Public Sector* (National Archives of Malaysia, 2010). These provide guidelines for public servants in managing official email from creation to use, maintenance, and disposal so as to ensure that it is accepted as evidence of business processes and official activities (National Archives of Malaysia, 2010).

The Guideline on Email Management and Preservation in the Public Sector (National Archives of Malaysia, 2010) is specifically about managing email in the Malaysian Government. The guideline briefly explains the management of email records that are categorised as open-access types of records, until disposal. According to this guideline:

“Official email that has been captured in the EDRMS shall not be destroyed without written permission from the Director of the National Archives of Malaysia as specified in Section 25 of the National Archives Act 2003 [Act 629]. However, official email that has been filed physically or electronically can be removed from the individual mailbox to reduce email storage.” (National Archives of Malaysia, 2010).

In the context of records management, this guideline may help public servants to understand the value of email records and that it is essential to capture emails in the record keeping system. Another reason for ignorance of *Electronic Records Management in an Unstructured Environment* (National Archives of Malaysia, n.d) and *Guidelines on Email Management and Preservation in the Public Sector* (National Archives of Malaysia, 2010) is that there has been no initiative by NAM to implement the guidelines. Users have been aware of the *DDMS Manual* from MAMPU since the implementation of the DDMS and this publication is considered vital throughout the federal government in Malaysia. There is a recommendation from the RO that guidelines combining NAM and MAMPU advice on managing email records in the public sector could be published which would be beneficial to users instead of having to refer to different guidelines and manuals. NAM should publish a guideline that need to be relevant and

applicable to the Malaysian Government in the context of electronic record keeping and the cloud environment.

The National Archives of Australia (2018) highlight that the implementation of email policies and guidelines needs to be disseminated through appropriate communication channels (e.g. newsletters, induction for new staff) and should not be a 'once only' activity at system launch but should continue. Compliance with email policy and guidelines can be encouraged by publicising existing principles among public servants. This will increase the level of awareness in government agencies.

6.6.2 Business Process Analysis

A second component in successful digital business information management according to ISO 16175:1 (2010) is a business process analysis. Since records are created as part of business processes, business (work) process analysis can "be used to identify the records that should be generated from work processes and to manage them through time as assets of the organization" and "determine the requirements for records creation, capture and control. It describes and analyses what happens in a function in a specific business context (ISO/TR 26122:2008). Developers need to analyse business processes to identify the records inputs and outputs and associated roles and responsibilities for managing the electronic record keeping system. This is a practice that should precede any IT development or deployment. The fact that a second version of the DDMS was needed within a year in order to address its limitations suggests that user needs were not fully met. This implies that inadequate business process analysis was conducted.

The history of the DDMS started when MAMPU and NAM contracted a vendor to build a bespoke system. When it became clear that the first version of the DDMS did not fulfil the requirements for classified (protectively marked) records, and the vendor quoted a very high price for developing a new version of the system, MAMPU decided to build DDMS 2.0 in-house. This was supposed to contain the features necessary to capture and manage classified records, however it failed. Both systems are bespoke (Maciaszek, 2007), and were developed to cover the phases of the record life cycle.

The system may not have fulfilled the users' requirements due to various factors such as the developer not listening to the users' requirements, failure

to analyse email management issues among public servants and the existence of little or no communication between the developer and users (Blais, 2011). Users should have been asked about the types of system requirements they needed to help them conduct their business processes of the Ministry while at the same time allowing email records to be retained so as to have evidential value. The ministries are the main users of the DDMS, but rather than contacting them through email for the feedback about the system, MAMPU and NAM could have interviewed potential users and observed the typical email management procedures applied in the ministries in their analysis of business processes. Both organisations could have better understood how the processes work and then identified the requirements of the DDMS. As business analysts for the DDMS project MAMPU and NAM should have been able to see how the DDMS design could simplify the business activities of public servants and, at the same time, achieve compliance with the email record keeping policies and guidelines provided by them (Blais, 2011). These aims could have been achieved if the DDMS project had been managed more effectively and there had been better communication between MAMPU, NAM and users.

In summary, the process of implementing the DDMS in the Malaysian Government should not just focus on the system itself, and the DDMS Manual, but also the way public servants do their work by understanding work practices through careful business process analysis. As mentioned by McLeod et al. (2010), successful electronic records management requires an understanding of working practices, business processes and organisational drivers. The standards and practices that include the way how people work in managing electronic records should have been considered before implementing the DDMS project. NAM should have observed work processes in managing email records in order to understand them before specifying the system requirements for the vendor to develop the DDMS. MAMPU could have compared the actual work practices with functional requirements before designing the DDMS. As the two organisations with expertise in records management and ICT, they should have worked together to specify a system that met the requirements for an electronic record keeping system in a developing country, and potentially act as a benchmark for other similar countries.

6.6.3 Project Management

The third component of successful digital business information management is project management (ISO16175:1, 2011). Project management involves planning, control, and coordination of all aspects of a project, including its initiation, planning, execution, control, and closure, in order to achieve agreed objectives (Park and Allaby, 2013). MAMPU took the lead in the development of the DDMS since they received a budget from the National Key Economics Area (NKEA), Communications, Content and Infrastructure (CCI), Entry Point Project (EPP) 6, and e-Government or Paperless Government projects. They spearheaded the development of this project together with NAM (MAMPU, 2018). Their position in the Prime Minister's Department gave them the authority to take the lead on the DDMS project and they have the skills for developing the DDMS. However, this led to the DDMS being seen as an IT project rather than a record keeping system project. Even though NAM is responsible for records management and archives administration in the government sector, through smart partnerships and efficient and effective utilization of information communication technologies in the interests of society and the country (National Archives of Malaysia, 2019), they seem powerless in comparison with MAMPU. A key reason for this is their (lower level) position in the government hierarchy. NAM need higher level support from the government to ensure their authority and expertise in records management in the Malaysian Government are recognised.

This scenario is similar to that of The National Archives of the United Kingdom (TNA), a non-ministerial department, when it was located under the Lord Chancellor's Office. In the report of his review of the annual release of government records, Sir Alex Allan argued that TNA needed "higher level backup within Whitehall [the British government]" to ensure that the records management policies and guidance from TNA "are followed across government" (Allan, 2014, p. 6-7). However, this did not happen and records and information management was incorporated into the Cabinet Office, which launched an initiative to improve the flow of information in government (Cabinet Office, 2017). No evidence of implementation of the report's recommendations has been found. At the same time the TNA was moved from the Ministry of Justice to the Department of Culture Media and Sport on the grounds that the department was responsible for the government's digital

strategy. This split reflects similar divisions in Malaysia and may well militate against any effective progress.

Seen as an IT based project rather than a record keeping one, the Malaysian Government assigned the role of project manager to MAMPU, while NAM acted more as a project assurance representative with a private vendor as the system designer. The partnership should have combined their complementary knowledge and skills, i.e. IT skills (practical) and records management knowledge (theory) respectively, to develop a good record keeping system (the DDMS) that would enhance the management of government records. Sir Alex Allan recommended a similar partnership for UK Government records when he stated that “the Government Digital Service (GDS) and TNA need to work closely with departments on solutions for records management in the future” (2015, p1) “to help ensure new systems enable and simplify records management processes” (Allan, 2015, p6). He noted that both partners have important roles to play: “Departments will look to GDS for guidance and support on IT issues and to TNA for records management expertise, as well as leadership on cultural change. There will need to be high-level backup and co-ordination behind this, as well as to press the cultural changes needed” (Allan, 2015, p13). However, there is little evidence that any collaboration between the two is effective, largely because departments are free to choose their own systems and many prefer simply to adopt the ‘cheap’ strategy of using cloud storage.

Collaboration between MAMPU and NAM should have enabled the development of the DDMS since, together, they have the necessary complementary skills and knowledge as Wan Mohd Saman and Haider (2013) state:

“Records managers have the skills and methodologies to manage the lifecycle of records of all kinds, but they have to rely on information technology (IT) colleagues and vendors to provide the tools with which to do it. The task of the records manager, in collaboration with their IT colleagues, is to define the record-keeping and technical requirements and to make the right purchase. “

MAMPU should have sought NAM’s input on recordkeeping functional requirements on and enabled them to use and test the DDMS as a recordkeeping system before it was implemented. However, the partnership

was challenged given the 'power' of MAMPU and the DDMS being seen as an IT project.

The DDMS is a system that ensures that electronic records in the Malaysian Government can be maintained and preserved based on authenticity, reliability, integrity, usability and accessibility over time (MAMPU, 2014). By doing so the aim was to ensure the maintenance of the government's institutional memory and to implement standardised electronic records management across government business activities. Besides those crucial capabilities, a record keeping system needs to have additional value that can help users in performing their business transactions. The decision to develop this project was made at the meeting of the Government IT and Internet Committee (JITIK) on July 4, 2011 and the system was first introduced in 2014. The DDMS is considered to be a big project for the Malaysian Government since it is targeted to be implemented by the whole of the government by the year 2020. Less than two years were allotted for the development of the system, which is a very short time for such a big project. Thus, there was insufficient time to conduct a full business process analysis, but this project did not fully meet the necessary functional and non-functional requirements.

In every project there is a risk of failure. According to Hillson (2012, p13), "project failure is often not because of a lack of project management theory, tools and techniques or trained people, but due to the occurrence of unforeseen events which disrupt the smooth running of the project and cause irrecoverable deviation from the plan". The DDMS project team should have been aware of what lay ahead, including uncertainties and risks that would have affected the project. Communication is one of the success factors for project delivery. According to Olugbode, et al. (2008) communication is one of the main problems in improving information systems in order to increase operational performance and productivity in the organisation. Communication appears to have been ineffective in relation to the DDMS and seems to have stemmed from a lack of clarity about roles and responsibilities and hierarchical structures for controlling project progress, which Kilkelly (2018) identifies as being important. Strong project leadership is needed to ensure project success by building a high performance team to

develop trust and improve communication among team members (Kilkelly, 2018).

In summary, the DDMS partly meets the project management component of ISO 16175:1 (2011) and Ministry staff are partly compliant in using it. The system can manage only open-access records. Thus, the DDMS is incapable of managing at least one critical business process requirement. The preference of users for paper based records is one of the issues. Even though this project was completed on time, it did not fully satisfied the users' requirements. Risk and change management needed to have been considered more carefully.

6.6.4 Change Management

The implementation of a new system brings change to the organisation. To adapt to the changes, a change management component assists users in accepting the system in their business activities. The DDMS implementation only partly met this component since a change management programme does not appear to have been an integral part of system implementation, but was conducted subsequently. Change management involves the processes, tools and methods used to manage the human aspect in order to achieve the desired business outcome, and it has to incorporate organisational tools to help individuals make successful personal transitions resulting in the adoption and realization of change (Creasey, 1994).

Many government projects have failed as one of the implications of not implementing a change management programme as the following statement from the Former Prime Minister of Malaysia evidences:

“45% of government projects planned in the Eight Malaysia Plan (RMK8) were not successfully implemented and the funds for these projects have to be carried forward to the Ninth Malaysia Plan (RMK9)”. (Abdullah Badawi, 2006)⁷.

Specific examples of failed projects include the General Electronic Office (GEO) e-filing project in 2005, which was halted as it did not comply with the ISO standards⁸. (MAMPU2), and the 2016 1BestariNet project, which failed due to technical factors and delays due to construction approval issues (BERNAMA, 2016).

⁷ A former Prime Minister of Malaysia

⁸ No information on which ISO standard that did not comply

These project failures are linked to the lack of appropriate change management in the Malaysian Government; the government does not appear to have learned from them. According to Bakar (2016), many failures in the implementation of government projects are due to people-related change issues. Karim and Khalid (2003) have studied change management in the Government of Malaysia since the early 2000s. Change management should be a part of the implementation of e-government in Malaysia (Karim and Khalid, 2003). Since the Government of Malaysia started to implement e-government and e-filing in the public sector, they have received strong legal and organisational support. Legal support, such as that from the National Archive Act 2003 and Circular Letter 2015, are fundamental for the Government in ensuring the implementation of and compliance with managing electronic government records. Organisational support comes in the form of the Prime Minister's Office, the National Archives of Malaysia, MAMPU and other government agencies.

In the transformation of government services in Malaysia the public are encouraged to use e-government services and 1GOVNet services supplied by MAMPU. The Malaysian Government has developed an e-Government Steering Committee (EGSC), which is the main committee responsible for providing policy direction, approving e-government activities and programmes, and monitoring implementation (Ahmad, 2006). The EGSC is led by the Chief Secretary to the Government and includes members representing other government agencies such as Economic Planning Unit (EPU), the Implementation Coordination Unit, Institut Tadbiran Awam Negara / National Institute of Public Administration (INTAN), the Treasury, the Ministry of Energy, the Ministry of Communications and Multimedia, the Office of the Auditor General, Public Service Division and the Multimedia Development Corporation (MDeC). MAMPU acts as secretariat to the EGSC (Siddiquee, 2013).

Thus, even there is a commitment from senior people which is important for change management in the Malaysian Government, change management still could be improved with greater commitment and relationships among leaders and team members (Dahlan, 2013). Good leadership skills are required to conduct and implement a project, and team members need to

understand the technology used in conducting the task (Dahlan, 2013). The leadership role of introducing, explaining and guiding change in the organisation is essential for clarifying the point of implementing the change and assisting in the process of change for employees (Ghanim et al. 2013). As explained by de Andrade, Albuquerque, Teófilo, and Silva (2016), organisational culture is created by leaders and, therefore, the change must begin with the leaders. The leaders must be able to create a sense of need and urgency, to establish the vision and communicate it clearly and honestly. Furthermore, top management must realise the importance and necessity for change to cope with the emergence of technology. The history of failed projects suggests that top management in the Malaysian Government have not managed the change situation well enough. They may not have the crucial competencies for effective leadership which, according to Thach and Thompson (2007, p360), include

“Integrity, communication, technical competence, diversity consciousness, developing others, results-orientation, change management, interpersonal skills, problem-solving, decision making, political savvy, strategic thinking, customer focus, business skills, team leadership, influence skills, conflict management, more recently emotional intelligence, social and environmental responsibility, depending on the culture of the organisation even humour and innovation”

Top management and employees may be reluctant to be involved in the transformation process an understanding of the organisational culture could help to tackle the human issues involved in change management.

In this case study, the DDMS was developed using the skills and knowledge of MAMPU and NAM. NAM's expertise in records management is more as a regulator than a direct system provider has and they were not practically involved in creating the DDMS. MAMPU played the role of managing the system implementation. However, in terms of system design and system specification, it was unclear if MAMPU or NAM or both had joint responsibilities. The DDMS was implemented in the Ministry within a short period of time and Ministry staff were unprepared for it. Pre-notification and training could have helped them in preparing for the DDMS implementation.

As RO mentioned:

“Change management in the DDMS implementation was under MAMPU supervision. MAMPU conducted a workshop on the change management. MAMPU invited government agencies that have implemented and have not implemented the DDMS to share information and give some input on managing the DDMS. MAMPU also provides preliminary training for agencies that want to implement the DDMS”.

Together with a change management programme, the DDMS implementation could be improved if communication exercises and technology knowledge transfer programmes are conducted by MAMPU with the ministries (Bakar, 2016). MAMPU, NAM and the Ministry needed to communicate and exchange information and conduct training actively to improve the implementation of the DDMS. They could have learned from an exemplar from one of Malaysia’s benchmarking countries. In 2003 the UK Department of Trade and Industry (DTI) implemented an ERMS on time and on budget. They conducted a change management programme, named Management of Change, which involved briefings, training and communication. Over 5,000 users were trained to use the system within 10 months, contributing to its successful implementation and making a big difference to the way staff did their work (EDRM Benefits the DTI, 2005). Failure to create awareness at the early stages of the change in the system in the Ministry was, and is still believed by users, to be one of the reasons why there is not full compliance with the DDMS. Change management requires early attention so as to predict how well the project will be implemented and to ensure that its benefits are realised (Ghanim et al., 2013). Less awareness at the early stages of the change means that users are unprepared for the new system. In the context of this case study, the RO who is responsible for managing the DDMS and the registry in the Ministry, was less knowledgeable about the DDMS system and the new file classification scheme used to manage records in the DDMS and the centralised registry. The RO claimed that there was insufficient time to prepare for the DDMS and the centralised registry, leading to difficulties in managing and implementing the system:

“There was no awareness or early notification in the public sector of the use and functions of the DDMS. I used to work in another ministry as a Records Officer and the system was ‘go live’ on my first day. I had to implement and manage the DDMS on my first day at the former ministry. At that time, all the ministries were rushing to use the new file classification scheme and the DDMS system. I had to learn the new file classification scheme on the first day and, in the process, get to know the new system. This was not easy because I was a new employee there and people still had doubts about using the DDMS system. There were many issues regarding change management from paper based records to a hybrid record keeping system. If I was not a new employee, it would have been easier to convince the staff in the ministry to use the new file classification scheme and implement the DDMS. The employees would also have been more comfortable for me if I had not been a new staff member at the ministry on the first day of the DDMS’s implementation. Even in the current ministry [The Ministry of Communication and Multimedia Malaysia], the implementation of the DDMS was done in a rush. Short notice was given to implement the file classification scheme and the retention schedule for the hybrid system.”

The DDMS implementation started in 2014 in government agencies. However, the change management programme began in 2017. It took three years for the Malaysian Government to conduct a change management programme for the DDMS implementation that involved all levels in the Ministry. A post interview with a Liaison in the Ministry confirmed that communication was one of the issues in change management. Problems with communication between MAMPU and the Ministry impacted how the change was presented. People will accept change if they understand its benefits. Different stakeholders including MAMPU, public servants, citizens and other industrial agencies should involve in change management programme to ensure the system is successfully used (Bakar, 2016). To encourage acceptance, communication between MAMPU, top management, and employees is the key. The directive on the implementation of the DDMS as a tool in managing email records in the public sector in Malaysia needed to be fully clarified for those involved. In that way the objectives and the benefits of the change in system could have been accepted by top management and the employees. Overall, the main factors in change management with the DDMS are human, such as people preferences. The change Users should have been encouraged to accept the technology and convince them about the system’s benefits. People were afraid to accept the changes because they were comfortable with current practices (Pagon, Banutai, and Bizjak, 2008). According to Ghanim et al. (2013), effective

change management planning should be able to address any forthcoming challenges that may arise during the implementation of the change. A change management programme should have been conducted before the DDMS implementation.

6.6.4.1 Accountability and Responsibility for Email Record Management

The use of ICTs in managing public records can have positive or negative effects on the availability of records for purposes of accountability (Meijer, 2007). According to Jones (1992, p73) “the process of being called ‘to account’ to some authority for one’s action”. This means that accountability involves a selected individual doing an action according to policies and guidelines. The action taken is based on the mandate from people are that empowered. Performance audits, policy evaluations, legal procedures, and congressional investigations are examples of approaches used to assess in accountability. Accountability is a vital part of good governance Palmer (2000).

NAM and MAMPU are accountable for ensuring the success of the DDMS as a record keeping and business system in the Ministry. However, the accountability of NAM is vague. It was accountable at the development stage of the DDMS in acting as records management advisor. Government departments and agencies need to consult and gain advice from NAM in developing a record keeping system to ensure electronic records are managed according to good archival standards (Malaysian Government, 2007).

However, their role as subject expert in records management was barely seen in the implementation process. NAM provided a number of policies and guidelines pertaining to the management of email records in the public sector but government agencies were unaware of them. The National Archives of the United Kingdom (2014) note that every staff member has responsibility in managing records in the organisation. Interestingly, responsibility for managing email records depends on individuals rather than the organisation. Responsibility in creating, capturing and maintaining email records according to policies, guidelines and principles are based on the individual’s level of awareness. The RO was an individual directly responsible for managing the centralised registry and the DDMS in the government agency,

playing the role of providing input to public servants and encouraging them formally and informally to implement the hybrid record keeping system. Their role was to help NAM and MAMPU in guaranteeing that the implementation of the DDMS was effective and that it gradually achieved the objectives of the system.

6.6.5 Risk Management

The fifth component of successful digital business information management is risk management (ISO16175:1, 2010). Managing risk can help the project team to identify potential problems (Nokes, 2003). Risks and constraints should be identified early in project planning. Some risk factors include faulty assumptions and other constraints, and the changes brought. One of the biggest risks relates to the people involved, since they are dynamic, and communication failures among project team members.

During the development of the DDMS the project team, consisting of staff from MAMPU and NAM and a private vendor, did not identify the potential risks in the system implementation, including that it not be fit for the purpose of particular departments in managing their business activities. This led to technical issues reported by users (Chapter 5) and affected the level of compliance of the DDMS. Thus, the DDMS did not meet the requirement for risk management. This is slightly ironic given that one of the DDMS capabilities is risk mitigation. The DDMS is capable of managing the risks associated with illegal loss or destruction of records, and in preventing inappropriate or unauthorised access to records. One of the purposes of the DDMS is to avoid loss of Malaysian Government records as has happened in the past.

Even though the functional requirements of the DDMS have been identified based on ISO 16175, non-functional requirements such as availability and adaptiveness (Maciaszek, 2007) were not identified, leading to technical issues for the users. Despite the role of the Information Management Division in leading the implementation of ICT programmes for the Ministry (as described in Chapter 5), MAMPU is the only party that has the authority to manage technical problems with the DDMS. MAMPU could identify this as one area of risk and could delegate the responsibility to IT specialists and system administrators to solve problems and troubleshoot internally within

the Ministry. This issue had been difficult for the Ministry since the beginning of the system's implementation. The DDMS was unstable and some of the staff decided to create another system using their own initiative to solve the problem. The consequence was that internal systems, custom-made tracking systems and undocumented manual record keeping systems, such as with the decision making process in capturing email records in the DDMS, were established. These systems duplicated functions of the DDMS in conducting the Ministry's business activities. This is manifestation of Olugbode et al.'s (2008) findings that the main problem in the implementation of information systems in organisations is the duplication of effort, where more than one system has similar functions.

Two internal systems were identified in the Ministry. The first is a system developed before the implementation of the DDMS which successfully meets the Ministry's business activities. This system is still used in D1 as a back-up for the DDMS. The second system was created deliberately by OP1D2 and OP2D3 for the tracking of records. The custom-made record tracking system was designed for personal use to organise records without referring to any documented procedure. A major concern is that there are many bespoke and undocumented manual systems, and very little uniformity in operational procedures (Olugbode et al., 2008). This might be because of the trust issue with the DDMS record keeping system and there is no monitoring of the information or records-related systems used in the Ministry.

The trustworthiness of the DDMS in supporting business activities is low and this could be because of the technical issues experienced (as stated in section 5.8), or a lack of awareness, or that the DDMS has failed to meet users' requirements. As mentioned by Oliver and Foscarini (2014, p144), "if users do no trust in the organizational record keeping system or if they lack confidence in them, the outcome will be quite simple-systems will not be used" and as such represent a wasted for the government or project sponsor in terms of financial resources and for the project team in terms of skills, labour and time. It is a job of NAM and MAMPU to enforce compliance with the DDMS by promoting trust to implement the DDMS in managing their business activities. Generally, the trust issue with record keeping systems could be solved if the system developers communicated directly with users, rather than focusing only on the systems and technologies involved Oliver

and Foscarini (2014). The same context should apply to the implementation of the DDMS where NAM and MAMPU should actively communicate with the Ministry to ensure full compliance.

With the whole hierarchy involved in the project, a risk and change management programmes should be conducted before the implementation of the DDMS to ensure that the project fully meets the users' requirements.

6.6.6 Sustainability

The sixth component of successful digital business information management is sustainability. "The development and maintenance of automated systems generally straddle the budgeting cycles of organisations. When automating the management of records, care must be taken, as part of the development of a business case for the automation effort, to provide for the on-going viability, operation and maintenance of the system" (ISO 16175:1, 2010, p8). MAMPU, in conjunction with NAM, are responsible for planning and obtaining financial allocations for the maintenance, system security, and information and data security of the DDMS. As stated in section 6.6.5 above, MAMPU needs to rectify the technical issues related to the DDMS and needs a strategy for ensuring the sustainability the of DDMS version 2.0 since it is an in-house bespoke system. There was no indication as to who would be responsible for either day-to-day issues, system maintenance or enhancement. Therefore, MAMPU and NAM only partly met the sixth component.

6.6.7 Capability development

A seventh component of successful digital business information management is capability development, where "software automation requires organisations to develop or enhance the technical capabilities of affected line staff, as well as others in the organisation, who in some cases may have no familiarity with the technology" (ISO 16175:1, 2010). Use of the DDMS does not require high levels of IT skills. However, since the system was new, training should have been provided to users in preparation for them using is in the context of their daily business activities. MAMPU conducted training for users according to the level of staff in the Ministry, from top to lower management. Based on the study's findings, the RO needs to conduct

further training internally in the Ministry to improve users' IT and record keeping skills in using the DDMS.

Even though the system is used in the Ministry and one department is fully compliant, some users still prefer paper records as evidence of business activities. Training should be provided for different categories of staff to foster change (Department of Trade and Industry, 2005). Thus, NAM and MAMPU should trained RO first so that they are able to support the DDMS implementation and, handle induction courses that involve the Ministry's.

Early awareness of managing electronic records should be given to users in order to improve their capabilities and trust in using the DDMS. Care must be taken to develop these capabilities, as well as the technical capabilities of the organisation necessary to support and maintain automation efforts (ISO 16175:1, 2010). Therefore, capability development should be considered to be an on-going process to ensure that the system can fully meet both functional and user requirements. Again, MAMPU and NAM only partly met the requirements of capability development.

6.6.7.1 Training

Based on the findings, public servants in the Ministry are unfamiliar with the concept of record keeping systems, which suggests the training component was fully addressed. As stated by Parker (1999, p154), "once a framework of policies and procedures is in place, the framework developer needs to ensure that users understand what they have to do and how to implement the system". This is achieved by providing training which should be in accordance with the relevant principles in the context of record keeping (Kennedy and Schauder, 1998). The training should be provided before the implementation of the DDMS, as the DDMS users could then prepare themselves using the system interface and develop a basic understanding of how the system work. Support is then needed during and post-implementation. As stated by Oliver and Foscarini (2014), before a new system has been implemented, the organisation needs to identify the digital skills of the system users, then focusing on the particular system by providing training to them. Training is an essential element of capability development. "By focusing training specifically on email management (for instance, giving guidance as to choice of actions depending on the role (primary or copied)

of the recipient) it can be presented as a way of managing information overload while at the same time providing training in records management processes” (Oliver and Foscarini, 2014, p103-4). Training on managing electronic records from time to time can improved the level of awareness on email management. However, it is not easy to enforce staff to attend training session, unless there is a support from top management. Awareness on managing email needs to create at the early stage of the DDMS implementation. This will enhance the level of implementation on record keeping system in business transaction.

6.6.7.2 Electronic Records Management Awareness

Even though the concept of ERM has been introduced to public servants by the Malaysian Government, their levels of awareness of it are still insufficient. Much of the record keeping theory and practice originates from the paper-based world and is being superimposed onto the electronic world. The relevance of paper practices for the electronic world needs to be challenged. The fundamental objectives of the DDMS are as follows as taken from *DDMS Manual* (MAMPU,2014):

- To replace paper records with digital records;
- To progressively eliminate the use of paper;
- To enable digital and non-digital documents to be created, captured, stored, maintained and used electronically; and
- To enable all government matters such as the delivery of presentation material, internal circulars and letters between agencies and departments to be made electronically.

Two of the objectives are to replace paper records with digital records and to progressively eliminate the use of paper. These objectives seem to match Vision 2020 and ensure that Malaysia achieves its target to become a developing country that is paperless. However, the real-world practices may contradict these objectives. The Malaysian Government applies a hybrid record keeping system, including the DDMS and a centralised registry. This hybrid system means that both paper and electronic records are kept and used at the same time (MAMPU, 2014). Paper records are still being used as a back-up to the DDMS. The objective to replace paper records with digital records has not been achieved. The record keeping systems in the Malaysian Government may need revision in order to achieve the paperless objective and Vision 2020.

The transition from paper based records to electronic records slowly improves the level of awareness of electronic records. The implementation of the DDMS increased the level of understanding about managing electronic records which comprises any records that manage digitally and implicates the application of hardware and software in the government sector. Lack of awareness of electronic records management is often because it is seen as unnecessary or a low-priority administrative task that can be performed at the lowest levels within an organisation, despite the fact that records management is the responsibility of all individuals within an organisation as well as the organisation entity itself (Yusof, 2014). Government agencies have to educate themselves on the importance of managing email records and in understanding the impact of losing email records of business processes. The National Archives of United Kingdom stated that it should be ensured,

“That users understand the benefits to them of managing their email correctly, for instance that emails can be found in a timely way and emails will not be lost as a result of automatic deletion periods.”

Awareness among public servants can be created by encouraging them to use electronic records in their major business activities. NAM and MAMPU can actively promote their policies and guidelines related to ERM to the government sector. Both agencies can develop record keeping systems that are most suitable for the business activities of public servant in order to support the implementation of electronic records in the Malaysian Government. According to Yusof (2014), most developed countries have created initiatives in promoting electronic records management by including it as one of the subjects in higher education curricular.

To support awareness, governance and accountability in the organisation must be well structured in implementing electronic records management. According to Ghering (2010), one of the keystones for effective electronic record keeping is to ensure that the institution has the necessary governance and authority structures.

6.6.8 Quality Management

The eighth component of successful digital business information management in ISO 16175:1 (2010) is quality management, which is part of system maintenance. This is a process in which system capability is analysed based on a variety of criteria. Quality management involves a range of criteria related to the impact of the deployment of software on business processes (ISO 16175:1, 2010).

One of the most well known approaches to quality management is the Deming Cycle or Wheel, first developed by W. Edwards Deming in the 1950s Petersen (1999). This cycle is generic, applicable to many different contexts, and involves a four-stage approach to continually improve processes, products or services, and resolve problems. The four phases are: plan, do, check, and act (PDCA). The approach is embedded in the ISO standards for management systems for records (ISO 30300:2011 and ISO 30301:2011).

Whether or not the DDMS was designed by referring to the Deming cycle is unknown. However, assessment of the implementation of the DDMS can refer to this cycle to measure the system's quality. MAMPU and NAM could have developed test scripts for user acceptance testing and system performance criteria (Plan). They could then have conducted both structured testing, using the scripts, and unstructured testing by allowing users freedom to use the system as they wished in 'sandbox' sessions i.e. not using the actual system (Do). By conducting tests MAMPU and NAM would have understood if the system met user requirements and gained some measurement of system performance. As Kneuper (2017) notes to achieve a high quality system, the developer should focus on the testing phase in trying to prove that the programme is correct with respect to formal specification. The results would have provided a measure of the effectiveness of the system (Check). The final part of the cycle (Act) would have enabled solutions to any problems to have been developed and implemented. The cycle could have been repeated as often as was necessary or practical.

The quality of the record keeping system relates to its capability to capture and preserve records for future use with the added benefit that allows for the management of records in any format. The main aim of an email record keeping system is to support users in handling their business tasks and to

improve efficiency. The DDMS represents a new transformation in the Malaysian Government in the context of record keeping, and thus the implementation of quality management can help MAMPU and NAM and the Malaysian Government to improve the system to support the use of records as evidence of business activities in the government sector. However, quality management was only partly met in the context of the DDMS project.

6.6.9 Configuration Management

The ninth component of successful digital business information management is configuration management (ISO 16175:1, 2010). Configuration is a part of the project management of information systems (Project Management Institute, 2017). According to ISO 16175:1 (2010, p8), “it is necessary to ensure that the software not only has the necessary recording capabilities, but that these capabilities are configured correctly and in such a way that enables the system to operate appropriately in an organisation’s IT infrastructure”. The DDMS partly meets this component and duplicate systems are in operation for tracking of records, which were developed by some of the Ministry staff for personal use. There is a trust issue with the DDMS, and its ability to fulfil their business activities is one of the issues that the MAMPU and NAM failed to consider in configuring the system. In the planning stage in business process analysis the project configuration items and their structures should be identified at each project control point as stated in the IEEE Standard for Software Configuration Management Plans (2005).

The process of configuration management is should be conducted after the system has been implemented. The results from configuration management exercises are used to fulfil the requirements which have not been met. Relevancy, urgency, and enhancement features are some types of such requirements. It was unknown if MAMPU and NAM have conducted configuration management for the DDMS, but based on system inability to fit one of a particular department’s business activities shows that the DDMS has not fully meets this component.

6.6.10 Corporate Culture

The final component for successful digital business information management is the corporate culture. "It is vital that the culture of the organisation reinforces the value and importance of the good management of records and that it is something that is a standard expectation of all employees" (ISO 16175:1, 2010, p8). People usually focus on technical objectives rather than the organisational or information culture in organisations when information systems are implemented (Turner, 2004). Top management should pay attention to the promotion of an appropriate corporate and information culture in the organisation by reinforcing the value and importance of record keeping. In the government sector, a culture of compliance is a significant factor in supporting system change (Langevoort, 2017).

Power distance can be defined as "the extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally" (Hofstede and Hofstede, 2005 p46). Thus, power distance index described "the way power is distributed is usually explained from the behaviour of the more powerful members, the leaders rather than those led" (Hofstede and Hofstede, 2005 p46). As mentioned by Ketelaar (1997, p144), "in countries with a high power distance index, people are afraid of disagreeing with their bosses, who they like to see as autocratic or paternalistic. Hierarchy in an organization reflects the existential inequality between higher-ups and lower ones. Centralization is popular. The powerful have privileges. Whoever holds the power is right and good". This scenario applies to Malaysia, where the culture in an organisation relies on the preference of top-level management in practice. PIC1D2 made a decision about record keeping procedures, where emails were only accepted as evidence if printed and email records are viewed in printed format in Department 2, based on her personal preference. This culture influenced the level of compliance with the DDMS Manual (MAMPU, 2014).

Organisational culture is "invented, discovered, or developed by a given group as it learns to cope with its problems of external adaptation and internal integration" (Schein, 1992, p9). An information culture is the culture that ensures that attention is directed to information and yet still maintaining the organisational contextual issues (Oliver and Foscarini,

2014). According to Wright (2013, p17), an appropriate “information culture is a culture that is conducive to effective information management”. The information culture in the government sector needed to be identified and understood before the implementation of the DDMS. However, MAMPU and NAM failed to give advanced notice to the ministries in the implementation of the DDMS and this led to the ministries’ lacking awareness of the system. A culture of managing paper records was embedded in the Malaysian Government, but a culture of managing electronic records has only just started with the implementation of the DDMS. To try to understand the information culture in the Malaysian Government, an assessment was made using the information culture framework (Oliver, 2011). The framework comprises three levels each of which represents different factors that contribute to an organisation’s information culture. Each level can be explained based on the descriptions given by Oliver and Foscarini (2014) and are summarised in Figure 17. Level one, the bottom layer of the pyramid, represents the fundamental factors in the information culture which are difficult to change. These concern “the value accorded to records, or respect for information as evidence”, “preferences for different communication media and formats, as well as preferences with regard to sharing information”, “language requirements. What happens when multiple languages are required or when one language becomes dominant” and regional technological infrastructure. The technological infrastructure in the country or region that the organization is located in” (Oliver and Foscarini, 2014, p18).

Level two concerns “information-related competencies, including information and digital literacy” and “awareness of environmental (societal and organizational) requirements relating to recordkeeping” (Oliver and Foscarini, 2014, p18). Finally, level three concerns “The information governance model that is in place in the organization, as reflected in the organization’s information technology infrastructure and Trust in organizational recordkeeping systems.” (Oliver and Foscarini, 2014, p18-19). According to Oliver and Foscarini (2014), these factors are highly significant for successful record keeping and are the most susceptible to change.

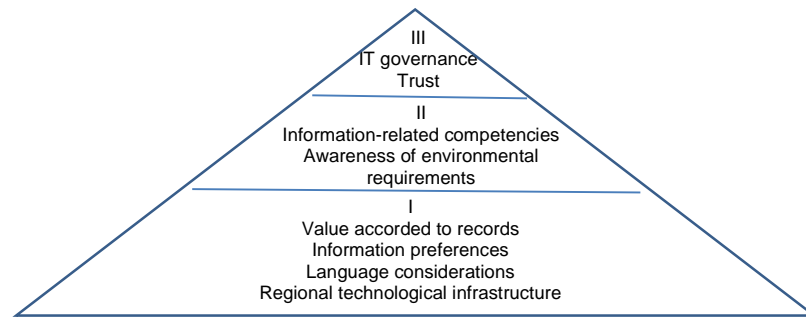


Figure 14: Information Culture Framework
Source: Oliver and Foscarini (2014)

Based on the findings and discussions in this study, the Ministry's information culture best fits the first level in the framework. They are still in a process of adopting an information culture in the organisation. The arguments about emails as evidence of business transactions show that some people in the Ministry prefer printed emails rather than digital email from the system. It is a great challenge to encourage people in the Ministry to change their work processes by implementing the DDMS, instead of using manual processes. Trusting the system to assist their business activities and awareness on electronic records management could improve the information culture in the Ministry to the next level. In the context of electronic record keeping system, different stakeholders need to be engaged, including records managers, IT specialists and end users. Based on the AC⁺erm project (McLeod et al., 2010), electronic record keeping involves different stakeholder groups; for example, executives or senior managers, records professionals, IT or system administrators and record-keepers. This project has identified that there are three major components involved in designing effective change in a record keeping project concerning people, processes and technology. Interestingly, the implementation of the DDMS is a dynamic process, and since the technology changes, so do people.

The change process after the Malaysian Government decided to implement the DDMS is related to people's acceptance of the changes. The most challenging issue in facilitating change in electronic records management is people, which includes culture, philosophical attitudes, awareness of records management and electronic records management issues, and preferences, knowledge levels and skills (McLeod et al., 2010). People tend to distrust new systems. If the system as developed is good, but people are reluctant

to use it, no benefits will accrue from it. Since people hardly trusted the DDMS, they tended to use a hybrid record keeping system to retain both (physical and digital) formats of records in the organisation.

Information culture in the government sector needs to be improved. The government of Malaysia would need to approach the third level in Oliver and Foscarni's (2014) information culture framework by enforcing senior management to implement the principles of managing email and practice the practices. Records managers and their records assistants in the ministries must play their part to nurture the information culture from within. It has to be mandated and pushed from the highest level as Moss (n.d, p9) asserted in the UK context "shortcomings in government record keeping ... [are] a matter for the head of the civil service - the Secretary of the Cabinet". Allan (2015, p6) suggests it will be easier if common tools and common processes are adopted and backed up by sustained and co-ordinated top down support and encouragement". This is one of the reasons why the National Archives Act 2003 regarding the records and archives management in Malaysia needs to be implemented and mandated by the Malaysian Government, so that public servants will see records as key resources and assets in the organisation. Public servants need to appreciate the importance of NAM so that it will be more powerful and its function will be recognised in the Malaysian Government administration. Former Director of National Archives of Malaysia, Zon (2019) stated on International Archives Day 2019 "people will recognise and see the impact of the National Archives of Malaysia if we have more power in the public administration." This is something that the Malaysian Government needs to consider and take action upon. Staff in NAM, specifically record officer (RO), should be able to promote an awareness of records and archives management in the ministries and other government agencies. They should know NAM's future direction in order to support and implement it. Other drivers are legislation, such as The Personal Data Protection Act 2010 and Right to Know Malaysia (R2K), should also focus minds. Citizens in Malaysia need to know that there is a right to access to information held by public bodies in Malaysia.

6.7 Conclusion

This case study investigated and explored issues related to email management in the context of record keeping in the Malaysian Government. Three main factors have influenced the implementation of the DDMS in the government sector concerning people, processes and technology. The DDMS project was seen as an IT project, and not as a records management project, and this led to the system failing to meet the functional requirements for digital records management systems in ISO 16175:2 (2012). The emergence of technology and the rapid change of the compliance environment have meant that the DDMS implementation is a dynamic process. The dynamic nature of the process of the DDMS implementation comes from the three factors above. Even though the DDMS was developed by a team including MAMPU and NAM, it did not meet the functional requirements for managing records and non-functional requirements that relate to the implementation of successful digital business information management outlined in the standard. Different stakeholders involved in the DDMS implementation, including MAMPU, NAM and the Ministry, need to ensure that email record keeping in the Malaysian Government achieves its objectives and fulfils the ISO 16175 standards. The DDMS project could be seen as a benchmark for the Malaysian Government in managing records in electronic environments if the system design is able to fulfil the functional requirements for digital records management systems (ISO16175:2, 2012). Managing email records not only focuses on people, in relation to the corporate and information culture in accepting a new system and system design, but it is also necessary to understand the process of email management. Referring back to Vision 2020, the Malaysian Government aims to completely supersede the use of paper records and shift to e-government and electronic record keeping. System development and implementation should be aligned with the vision as well as supporting the transition process from paper to digital record keeping in the Malaysian Government. To achieve the vision and ensure that the objectives of the DDMS as a record keeping system meet the relevant requirements, the people involved in the development and implementation of the system need to collaborate and create a better information culture. Overall, the system is just a tool used to assist in record keeping, whereas the people involved are the main factor in ensuring the success of processes used in record keeping

and that they achieve the objectives by implementing a good record keeping system that is able to support users' business activities.

CHAPTER SEVEN

CONCLUSION

This chapter discusses the overall conclusion of the research and how the research aim and objectives of the study were fulfilled. It also discusses the contribution to knowledge, reflects on the limitations of the research, and identifies potential future research.

7.1 Introduction

This research investigated the transition to email and the management of email, in the overall context of record keeping in the Malaysian Government, via an in depth case study of one Ministry, the Ministry of Communication and Multimedia. The practices and operational processes involved in developing and implementing electronic record keeping system in the Malaysia Government was explored. The research focused on evidence of managing email in practice in comparison with the principles provided by the two responsible government departments (MAMPU and NAM). Despite the principles, the employees in the Ministry of Communication and Multimedia Malaysia managed their email records based on their preferences and the established information culture in their departments.

7.2 Review of the research aim, objectives and research questions

The aim of the research was to critically explore the management of email in the context of the transition to digital record keeping in the government sector, concentrating on Malaysia.

The first objective of this research was to explore the legal and regulatory environment in relation to the Government of Malaysia and the information it creates and holds; and associated research question was what is the role of the National Archives of Malaysia and MAMPU in providing guidelines for managing email in the government sector in Malaysia? In Malaysia, the government is responsible for the information it creates and holds, and by which it can be called to account. As addressed in Chapter 2, and discussed in Chapter 6, NAM is mandated by the Malaysian Government through the National Archives Act 2003/ Act 629 to manage government records according to the records lifecycle. Overall, the governance of the legal

aspects of information creation and retention is overseen by NAM. However, since the Malaysian Government began adopting an e-government programme, a hybrid record keeping system has of necessity evolved. Even NAM provides guidelines on electronic records management, but the role of NAM is more into providing paper based records guidelines where MAMPU is particularly providing ICT guidelines to the Malaysian Government. MAMPU's involvement in developing the electronic record keeping and information system for the public sector provides a new perspective on managing information in a digital environment. MAMPU's role has overtaken NAM's role in terms of managing electronic records, since it is MAMPU's responsibility to modernise the Malaysian Government's administrative procedures. MAMPU and NAM are also responsible for developing policies and guidelines for the Malaysian Government that are related to electronic records management. However, this research focused on policies and guidelines specifically related to email records management. Some Ministry staff are only partly aware of the guidelines from NAM (see the third objective below).

The Government of Malaysia has a Personal Data Protection Act 2010/Act 729 (Malaysian Government, 2010) which principally aims to control the collection, holding, processing and use of personal data in commercial transactions and to prevent malicious use of personal information. This legislation plays a crucial role in protecting individuals from any harm arising from the misuse of personal information (Oan and Su, 2010). Public servants have a right to be informed about data protection and the Malaysian Government could provide information on the principles on its website.

The second objective was to explore the evolution of email record keeping in the Malaysian Government and the associated research question was why and how does the government sector in Malaysia manage and integrate email records in the overall context of record keeping? The transition to email record keeping in the Malaysian Government started with a shift from using letters as a communication medium to using email, resulting in a shift from a paper based to a hybrid record keeping system. Even though the Malaysian Government has accepted email as records, not all public servants welcome the idea. Public servants need to accept email as not just information, but as a record that provides evidence in business transactions and is admissible

in court. As addressed in Chapter 4 (Case Study) and Chapter 5 (Findings), the evolution to email record keeping is designed to support paperless e-government as a component of the Government's Vision 2020. The transition to electronic records has been influenced by Vision 2020 that addressed the e-government implementation programme (Johare, 2001). In addition, the natural hazard of severe floods, that destroyed government records previously in several states, also stimulated the Malaysian Government to develop the DDMS as an electronic record keeping system and, in effect, a hybrid record keeping system to manage email records. Both NAM and MAMPU have had roles in addressing the needs of managing information in electronic record keeping systems. MAMPU and NAM used a vendor to build the system. The DDMS was developed based on the principles and functional requirements for records in electronic office environments articulated in MS ISO 16175-2:2012, Malaysia's adoption of the international standard (MAMPU, 2018).

This research uncovered no information as to whether, during the development of the DDMS, reference was made to any similar systems or not. The DDMS only partly meets the requirement for all types of records since the system security is only relevant for open access records that bear no protective marking. Based on the assessment of the DDMS against ISO 16175:1 (2010) and ISO 16175:2 (2011) requirements many of the requirements have not been met (Chapter 6). Significantly, business process analysis did not appear to have been carried out during a preliminary stage (business process analysis) in the DDMS project. Business processes should be recorded in standard operating procedures or similar.

The third research objective was to critically review existing policies, guidelines and systems for capturing and managing email in the Malaysian Government from a record keeping perspective. This enabled two of the research questions to be answered, viz. the extent to which the guidelines are effectively aligned with the functional requirements of electronic records management, and the role of the National Archives of Malaysia and MAMPU in providing guidelines for managing email in the government sector in Malaysia. Policies and guidelines relating to email record keeping have been developed by NAM and MAMPU and are varied. The specific research question associated with this objective was to what extent the guidelines are

effectively aligned with the functional requirements of electronic records management, which are expressed in ISO 16175:1 (2010) and ISO 16175:2 (2011). There is one piece of legislation, three circular letters, one policy, and eight main guidelines that contain three sub-guidelines related to the management of email (Chapter 4). One of the guidelines is the *Electronic Records Management Systems - System Specifications for Public Offices Version 3* (National Archives of Malaysia, 2011) whose content is mostly similar to ISO 16175:2 (2012). The assessment of the DDMS against these requirements indicated that these guidelines had not been implemented. Two others - the *DDMS Manual* (MAMPU, 2014) and the *Managing Public Office Records* guideline (National Archives of Malaysia, 2016) - had been compiled together with the DDMS implementation and distributed to the employees in the Ministry as addressed in Chapter 5 (Findings). The other six guidelines are: 1) *Guideline for Managing Electronic Records in the DDMS*, 2) *Guideline for Managing and Preserving Email for Public Sector*, 3) *Guideline for Electronic Records Management*, 4) *MyMIS*, 5) *Guidelines for the Implementation of the Rationalisation Public Sector Websites* and 6) *The Malaysian ICT Strategic Plan: Powering Public Sector Digital Transformation 2011-2015*. The Managing Public Office Records guideline is not listed in Figure 2 (Chapter 4) since it covers paper records. Since the Malaysian Government is implementing a hybrid record keeping system (National Archives of Malaysia, 2013) both electronic and paper records are used in business processes. Both electronic and paper records guidelines were developed to manage government email records and to assist public servants in managing their electronic records, specifically email. Despite the guidelines from NAM being effectively aligned with the functional requirements of electronic records management, there is a lack of promotion on the guidelines to be implemented in the Malaysian Government.

The fourth objective was to investigate the current practices of managing email in a selected part of the Malaysian Government against existing policies and guidelines. The specific research question that associated with this objective was what tools and mechanisms are needed for the effective management of emails as records?. The participants involved in the case study were within three departments of the selected Ministry, with three different roles, as discussed in Chapters 3 and 5. Three major factors emerged that had influenced the implementation of email records

management in the selected Ministry - people, systems and work processes. "People, process and systems or technology aspects of electronic records management are inextricably linked" according to McLeod et al. (2010, p ii) whose international AC+erm (Accelerating positive Change in Electronic Records Management) project identified the "powerful role of people" in managing electronic records (McLeod, Childs and Hardiman, 2011, p91). People issues "are predominant, fundamental and challenging because they concern culture, philosophical attitudes, awareness of records management and ERM issues, preferences, knowledge and skills" (McLeod, Childs and Hardiman, 2011, p75). In this study of email management in the Malaysian Government, it emerged that information culture was affecting how people in the Ministry adopted and accepted the DDMS as a new system and its impact on changing their work processes. The Malaysian Government has chosen Vision 2020 as a target for transformation to e-government and expands electronic records management. Thus, public servants need to take Vision 2020 in order to raise information culture among them. Since people issues are predominant in implementing electronic record keeping systems (McLeod, Childs and Hardiman, 2011), and greatly influence the success of systems implementation, MAMPU and NAM need to support the Ministry staff by, for example, improving their awareness of and skills for email record keeping before they adopt the DDMS into their work processes. People include different stakeholders i.e. the Malaysian Government, NAM, MAMPU and the Ministry that were involved in the DDMS implementation. Just as McLeod, Childs and Hardiman (2011) discovered that people's attitudes and perceptions towards a record keeping system influence its implementation so was this demonstrated with the DDMS in the Ministry studied. Even though the Malaysian Government has assigned ROs to every ministry and government agency, every public servant needs to prepare their mind-set and change any negative perspective of new technology and retain a positive one. One particular department's preference for paper records resulted in only partial compliance with the DDMS. Thus, the system has not yet been fully implemented in the Ministry and does not meet the objective of capturing and providing access to all government records in the system 24 hours a day (MAMPU, 2018). There is no formal monitoring procedure to ensure compliance with the DDMS, even though there are formal key performance indicators (KPIs) to measuring public servants' performance such as work

processes, system used and customer satisfaction. There is nothing specific in relation to the implementation of the DDMS by public servants.

Policies and guidelines are significant components to ensure that work processes are compliant with record keeping requirements. Despite personal preference, lack of awareness of existing guidelines and policies for managing email was one of the issues in the implementation of the DDMS in the Ministry. The Ministry were not complying and following the policies and guidelines provided by NAM specifically because they were unaware of them. Engagement between NAM, MAMPU and other government agencies may increase the level of awareness of the principles in business processes. Guideline developers could promote through the whole Malaysian Government a revised guideline and the reason for implementing it.

Technology developments have influenced the electronic record keeping system development and implementation in the Malaysian Government. However, the DDMS has not been fully implemented by a particular department because it does not meet their needs for protectively marked records with a 'secure' classification held in the department. This system did not implement all the functional requirements for electronic record keeping. The DDMS was approached as an IT project instead of a record keeping project despite that fact that previous research has identified that "one of the critical success factors for electronic records management implementation is when the system project is not approached as an IT project" (McLeod et al., 2010, p9).

7.3 Contribution to Knowledge

The major contribution to knowledge of this research is the in-depth case study of the management of email in the context of the transition to e-government, in a country with a developing economy and a complex constitutional framework. The AC+erm project (McLeod et al., 2010), found only three case studies that were related to email (discussed in Chapter 2) but none of them was specifically about email as a record keeping system and no other detailed study of email record keeping has been found in the later published literature. Thus, this research is unique because it is one of the first attempts to study email record keeping in the field of Information

Science. It provides evidence about current practice compared to the principles of email record keeping, in one specific context - the Malaysian Government and its e-government vision. The participants represent a wide range of stakeholders and government agencies, included the principles and system developers, and users from the Ministry differentiated by roles and departments. A combination of methods, including interviews, government documentation, observations and interview notes, were used as evidence.

This case study demonstrates how the three major components that are people, processes and technology, identified in the AC+erm project (McLeod et al., 2010), were also the main factors in the implementation of the DDMS in the government sector. Two predominant issues emerged; the first relating to the organisation's information culture, and the second relating to the management of the design and implementation of the system.

The team responsibilities for managing the DDMS project were unclear. The documentation on the DDMS project has not permitted to view. This is giving a limitation to identify the responsibilities in detailed. Not all of the three best practice project management roles, i.e. project manager; customer, user and supplier, and project board (e.g. PRINCE2, 2017), appear to have been a clearly identified and assigned. The relationships between the stakeholders that participated in the project suggest a silo mentality. The stakeholders could have worked more effectively together. Communication, particularly between those involved in the preliminary stage of the DDMS development, is vital for facilitating effective project management. Better project management would have helped to deliver the DDMS in such a way that it would have successfully fulfilled users' needs. This requires planning, organising, monitoring and controlling all aspects of a project and to provide the inspiration to all involved to achieve the project objectives safely and within an agreed time, cost and performance criteria (Atkinson, 1999). The function of project management includes identifying the work and resources required, establishing the extent of work, planning its execution, monitoring the work in progress and adjusting any deviations from the plan (Munns and Bjeirmi, 1996). Delivering this is the responsibility of the project manager, in this case MAMPU. They should have been able to identify and plan every single aspect involved in the project before implementation to avoid system design and implementation failure. Mismanagement in the DDMS project

was detected. The first version of the DDMS (1.0) was not fit for purpose for classified (protectively marked) records and hence DDMS 2.0 was developed to overcome this issue. Yet it still failed because it does not appear to manage classified records in the government sector.

Moreover, the study shows the significance of the position of NAM and MAMPU in the Malaysian Government. Their positions are one of the key factors that influenced their authority in managing the DDMS project. Both NAM and MAMPU were accountable for governance of the DDMS. NAM is overseen by the Ministry of Tourism and Culture of Malaysia whereas MAMPU is a member of the Prime Minister's Department. As a records management subject expert, NAM should have occupied a senior, leadership position in the development of the DDMS (identified as a record keeping system). However, that authority was assigned to MAMPU, since one of its major roles in the Government of Malaysia is acting as the leader in developing ICT for the public service sector and modernising and reforming the public sector information systems (MAMPU, 2018). This demonstrates that the government regarded the DDMS as an office management IT system rather than a record keeping one. Advice from NAM in developing the system based on the National Archives Act 2003 mandate was need to make decisions about records management, including the management of electronic records (Malaysian Government, 2003), however, about the extent of NAM's experience in electronic recordkeeping systems is unclear.

The DDMS was developed according to the electronic records management functional requirements provided by NAM, which were based on MS ISO 16175:2 (2012). However, NAM's authority was over-ridden because of their position in the Malaysian Government and their main expertise, which is not ICT. However, the DDMS did not fully meet user and record keeping requirements because there appears to have been inadequate, if any, business process analysis at the initial stage of the system's development. The components of successful digital business information management, identified in MS ISO 16175:1 (2012), do not appear to have been sufficiently well addressed.

Hofstede and Hofstede (2015, p282-283) defined culture as “the collective programming of the mind which distinguishes the members of one group from another”. “Culture is passed from generation to generation, and it is changing all the time because each generation adds something of its own before passing it on” (Belshek, 2006, p2). Information culture is “the socially shared patterns of behaviors, norms and values that define the significance and use of information in an organization” (Choo et al., 2013, p775). It is “reflected in the organisation's values, norms, and practices with regard to the management and use of information” (Choo, 2002, p54), which includes record keeping. According to (Choo, 2013, p 776-778) there are four types of information culture - result-oriented culture, rule-following culture, relationship-based culture, and risk-taking culture – which are explained as follows:

“In a Result-oriented culture, the goal of information management is to enable the organisation to compete and succeed in its market or sector. In a Rule-following culture, information is managed to control internal operations, and to reinforce rules and policies. In a Relationship-based culture, information is managed to encourage communication, participation, and a sense of identity. Finally, in a Risk-taking culture, information is managed to encourage innovation, creativity, and the exploration of new ideas.”

Choo (2013, p776) goes on to say that “each information culture type may be characterized by a set of 5 attributes: the primary goal of information management; information values and norms; information behaviors in terms of information needs, information seeking, and information use”. “Every organisation has an information culture. Being able to analyse and understand this culture is instrumental in developing records management programmes and systems that take people, the employees of the organization, into account” (Oliver and Foscari, 2014, p1). It is therefore important for information professionals, such as records managers and archivists, to understand the concept of information culture.

In any organisation, especially the government sector, power distance plays the biggest role in shaping organisational culture. Hofstede (2011, p9) identified the concept of power distance as “the extent to which the less powerful members of organizations and institutions (like the family) accept and expect that power is distributed unequally”. According to Ketelaar (1997, p144), in the context of archival science, “hierarchy in an organization

reflects the existential inequality between higher-ups and lower ones". The most authoritative in the hierarchy have privileges and "whoever holds the power is right and good" (Ketelaar, 1997, p144). This scenario is evident in Malaysia. Culture in an organisation is influenced by top-level management preferences and practices. It influences the information culture in the Ministry. According to Clearly Cultural (2018), which produces information on Hofstede's cultural dimensions from data that has been collected through questionnaires, Malaysia has the highest power distance index score of all of the countries in their listing. It is therefore not surprising to see the result from Department 2 that PIC1D2 made the decision about the record keeping procedures.

The assessment of the information culture in the Ministry of Communication and Multimedia in Malaysia (Chapter 6) indicates that the Ministry studied is at the first (lowest) level of Oliver's (2011) information culture framework. The characteristics of the level (such as the value accorded to records, attitudes and behaviours, the extent of the development of record keeping infrastructure in terms of expertise, policies, procedures and systems, IT usage and information preferences) are such a fundamental part of an information culture that they are very difficult to change. This means it is a significant challenge for the Ministry. Everyone has a role to create and capture records in a record keeping system (Oliver and Foscarini, 2014), thus each individual in the Ministry should have an awareness of and positive attitude towards record keeping to ensure records are safe as evidence for business transactions.

Each individual in the Ministry should be willing to carry out record keeping procedures such as email capture in the DDMS, participating in records management training and accepting change (implementing the DDMS in handling business activities). If not, compliance with the DDMS implementation senior management in the Ministry need to use their authority to push employees implement the DDMS without concern for their personal preference. These activities will improve the information culture in the Ministry and support the move to paperless government. The non-compliance issue, which is a cultural issue in managing electronic records in the government sector, is because "users are reluctant or too busy to manage email" (Allan, 2014, p10) even though an electronic record keeping

system should help users to manage email. However, as Sir Alex Allan noted “a number of questions, such as “does the system intended to store and manage emails actually work?” and “does the process meet both user and business needs?” (Allan, 2014, p10).

Despite tackling the first level in information culture framework (Oliver and Foscarini, 2014), the government of Malaysia may approach the third level by enforcing the senior management to implement the principles and practices in managing email as records in the government sector. The senior management can decide the penalty for employees that do not comply with them. As Allan (2015, p1) discovered in his review of government record keeping in the UK, one of Malaysia’s benchmarking countries, EDRMS have not worked well, processes are burdensome and compliance is poor: “even with improved systems, there will be a need to ensure the appropriate culture is embedded in departments and that changes are backed up by a high level push to make sure new procedures are followed in practice”.

Training should be actively provided to senior management and employees in the organisation on using the system. “Consequently, much time and attention is (or should be) paid to the development of training programmes for everyone contributing to the work of the organization” (Oliver and Foscarini, 2014, p92). Records managers in the government sector can be more proactive and support the information culture in the organisation by encouraging them to take part in electronic record keeping system training and demonstrate their skills in implementing the system. The fundamental issue is to ensure all in the organisation trust the electronic record keeping system.

7.4 Conclusion

Email is a knowledge asset for the organisation that has to be retained and managed (Seow, Chennupati, and Foo, 2005). McMurthy (2014) states there are three approaches to managing email: employee strategies, the employer’s strategies and email inbox improvement strategies (see Chapter 2). The findings of this research reveal that the approach to email management in the government sector in Malaysia is related combination of the DDMS (an employer strategy) and employees’ strategies. The success

of the DDMS, or not, is related to the information culture of the government servants and, hence, the employees' strategies or practice.

This culture reflects the compliance with the DDMS and the *DDMS Manual* (MAMPU, 2014). The combination of authority of their expertise on records management and ICT contributed to Department 1's more positive information culture and thus it being fully compliant with the DDMS implementation. Department 2 was partly compliant with the DDMS implementation and this was clearly influenced by the senior officer's (PIC1D2) preference for paper based records. In Department 3, even though the senior officer was positive about the DDMS implementation and the information culture is good, the inability of the system to meet their business process requirements meant they were not compliant with the DDMS. This in-depth case study explored email record keeping in the Malaysian Government through a variety of rich data sources.

Email record keeping practices are based on the implementation of the DDMS and are supposed to comply with policies and guidelines mandated by an expert board in electronic records management and information systems drawn, for example, from NAM and MAMPU. Bringing the manual and the guidelines, developed by NAM and MAMPU, together into one single document may improve compliance with email record keeping policies, since public servants could refer to the overall hybrid records management system in a single documentation.

The evolution of email record keeping is designed to support paperless e-government as a component in Vision 2020, however the hybrid record keeping system that was found to operate in practice is not compatible with this vision. It became evident that the DDMS has not yet been fully implemented for a number of reasons, primarily relating to the organisation's prevailing information culture and inadequacies in the approach to system design and implementation. The failure to conduct adequate business process and user requirements analyses to inform the functional requirements for the system, as this research has shown, has contributed to the poor design implementation of the DDMS. It is not too late to address these problems.

People are the biggest factor in the implementation of email record keeping in the Malaysian Government. People act as intermediaries between technology and records. This research acknowledges the power of people in managing electronic record keeping in the public sector. People are paramount, particularly their attitudes to the value of information, their information behaviour and preferences, their understanding of policies and guidelines, and the need for change. An information culture that aligns with the Ministry and the Malaysian Government's mission and objectives is needed. Such a culture recognises the value of information and how information is and can be, used in the Government of Malaysia.

Successful record keeping requires public servants with the information related competencies to carry out their records responsibilities, good IT governance, and the trust of people in record keeping systems and processes. Trust influences the effectiveness of the information culture in any organisation. Awareness of information culture can improve both productivity and governance not only of email record keeping, but also the whole implementation of information systems in the government sector.

As a whole, the Malaysian Government could increase the level of awareness of the importance of email as records and emphasise electronic records management as a core component in business processes by promoting its importance more coherently and with greater determination. Training on managing electronic records could affect the level of compliance and raise the awareness level of the importance of electronic records management in business processes. Public servants need to accept email as not just information, but as a record that provides evidence in business transactions and is admissible in court. Consideration of information culture may provide a way of achieving this and improving the level of acceptance of the new system.

The DDMS should have been approached not as an IT project but as a record keeping project since the function of the DDMS is to “control the processes for capturing and maintaining evidence and information about business activities and transactions of Government agencies by providing for the efficient and systematic management of records throughout the records lifecycle, from creation, disseminate, maintain and finally disposal”

(MAMPU, 2014). The project should have been assigned to NAM instead of MAMPU given their record keeping responsibilities for the Malaysian Government. MAMPU and NAM also need to work together with the ministries to improve issues in the DDMS implementation that relate to email records, such as technical problems, functional requirements and people's preferences.

At present the system does not fit working practices because not enough attention was given to understanding business processes and work flows. NAM and MAMPU also need to review whether the policies and guidelines developed are compliant with staff email practice. Bringing the manual and the guidelines from NAM and MAMPU together, so that public servants can refer to the overall records management system in a single document, may improve compliance with managing email record keeping policies.

The research findings can inform other government agencies and organisations both in Malaysia and elsewhere in addressing the hugely complex task of implementing effective email record keeping systems.

7.5 Limitations of the Research

Although the research fulfilled its aim and objectives, there are a number of limitations. This research was an in-depth case study, which covered only one selected ministry out of 24 ministries and 6 government departments or agencies in Malaysia with 20,000 users (MAMPU, 2018). Thus, these findings may not translate to other ministries and government departments or agencies in Malaysia. Another limitation is that access was not permitted to the DDMS project documentation, such as statement of requirements and project management plan, meaning important information was not available. This limited the depth of the assessment of the DDMS against the ISO 16175 (2010) requirements.

7.6 Future Research

Further research could investigate the same phenomenon in other ministries and government agencies to identify similarities and differences. Such research would help identify best practice in managing email records across the Malaysian Government. Comparative studies between similar developing countries, using content analysis of government documentation, would increase the level of knowledge of managing email practices and principles across the government sector. These would draw out the differences between email record keeping practices in those countries and Malaysia. This would help to benchmark current email record keeping practices in Malaysia and identify potential routes to improvement. Moreover, further research is required to set some common standards or benchmarks for email record keeping in the Malaysian Government that can be used as a guide to implement a fully compliant email record keeping system. In this way, the limitations of the current study can be improved particularly as the Malaysian Government is planning to upgrade and enhance the services offered in the use of the electronic record keeping system (MAMPU, 2018). Adopting the research methods and design used here when conducting future research would enable easier comparison of wider findings.

Two further avenues for future research are (i) an assessment of information culture and user information behaviour in the Malaysian Government to better understand their influence on the implementation of electronic records management in the government sector; and (ii) the exploration of other technology approaches for managing email in the government sector, which do not rely on people's compliance with procedures, for example the Capstone strategy combined with automatic capture (National Archives and Records Administration, 2015); tools recommended by the Task Force on Technical Approaches to Email Archives (2018, p83), or digital forensics and other tools, which are being used or developed in other national government contexts (Palmer, 2011; Allan, 2015 para 29).

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Appendices

Appendix 1: Example of Relevant literature for Research

No	Date	Source	Keywords	No of Hits	Title of Article Selected
1	17/08/2015	NORA	Risk Management +organization	1,868,629 results	Risk management of organisational records
2		NORA	Management of ERM	926,770 results	Review of empirical studies from the ESARBICA region
3		Google	SARBICA +Malaysia	136,000 results	Experience and practice in ensuring authenticity of electronic in national archives of Malaysia
4	18/08/2015	NORA	Risk Management	6,019,213 results	The Risk Management Rethinking the politics
5					Risk management guidelines
6	20/08/2015	Google	Moreq2010 Specification	7,820 results	MoReq2010-Core+Plugin(v1-0)
7	24/08/2015	NORA	Email Management	852, 312 results	Personalized Email Prioritization Based on Content and Social Network Analysis
8					Methods and apparatus for determining the importance of email messages
9	25/08/2015	Google Scholar	Government records management	1,770,000 results	An annotated bibliography of multidisciplinary information in NZ government
10		NORA	Email Management	852, 312 results	Discovering collaborative knowledge-intensive processes through email mining
11	27/08/2015	NORA	Email Management	852, 312 results	Mining Social Networks for Personalized Email Prioritization

12	28/08/2015	e-Resources	Email Management	1,692,088 results	The contribution of email volume, email management strategies and propensity to worry in predicting email stress among academics
13					Coping-with-information-overload-in-email-communication-Evaluation-of-a-training-intervention_2010_Computers-in-Human-Behavior
14					Dealing-with-My-Emails-Latent-user-needs-in-email-management-_2011_Computers-in-Human-Behavior
15	06/09/2015	LISA	Email management	524 results	ILL-Email Management_15 Wasted Years and Counting
16		Google			JISC Mail
17		NORA		852, 312 results	Age, mobility and email
18		NORA			Email overload : Exploring the moderating role of the perception of email as a business critical tool
19		NORA			Employees' perceptions of email communication in Australia
20		NORA			Globalization of trust and internet confidence emails
21		NORA			Challenges of Information System Use by Knowledge workers_the email productivity paradox
22	07/09/2015	NORA	Email management techniques	302,954 results	Modeling Email Use: A case of email system transition
23		Library catalogue			Brilliant Email
24		NORA	ISO15489	28 results	ISO 15489 Records Management
25		NORA	Managing email	241,019 results	Managing email overload in the Workplace
26		NORA			You've got email! Does it really matter to process emails

27	08/09/2015	NORA	Managing email in the organization	147,521 results	Managing Citizen: Initiated email contacts
28		Google Scholar			Email in Personal Information Management
29		NORA			Managing Email : Overview of issues
30		NORA			1 in 5 UK Workers Spend 32 Days a Year Managing Email
31		NORA			Staying out of Court: Managing email by design
32		NORA			Managing Those Email
	09/09/2015 - 15/09/2015	Read and analysed the articles and began to write the literature review			
33	16/09/2015	Library catalogue	Email	595 results	Email Revolution
34		Library catalogue			Email : Law, Practice and Compliance
35	17/09/2015	Google	Email and records management	76,900,000 results	Email : NARA
36		Google			Whitehouse : Managing records directive
37		Google			Managing Email : National Archives of Australia
38		Google			Electronic Records Management Guidelines : Minnesota Historical Society
39	20/09/2015	NORA	Email Server	156,719 results	A SMS Based Security Providing for an Email ID by Creating an Email Server
40	21/09/2015	Google	Email vs Letter	142,000,000 results	Differences between Emails and Letters
41		Google	Email guideline Malaysia	6,060 results	Panduan Penulisan Surat Rasmi, Memo, dan Emel.
42	24/09/2015	ZETOC	Email Managment	474 results	

43	25/09/2015	Google	The technical development of internet email	714,000,000 results	The technical development of internet email
44					Email Milestone Timeline
45	27/092015	Google	Evolution of Email message	169,000,000 results	The Past, Present & Future of Email [INFOGRAPHIC]
46			Email History	2,270,000,000 results	Email History
47	28/09/2015	Lexis Nexis	Evolution vs Revolution	98 results	None related
48		ACM Digital Library	Evolution of Email	8, 180 results	Evolution of Conversations in the Age of Email Overload
49					Next Generation Mail : Toward a Personal Social CRM
50					
51		Google		31,500,000 results	Evolution and Revolution
52					Change: evolution or revolution? Change Factory
53					What is the difference between revolution and evolution?
54					Revolutionary Innovation Vs. Evolutionary Innovation
55	29/09/2015	IEEE Xplore Digital Library	Internet Revolution	613 results	
56		Web of Knowledge	Email Evolution	17 results	Research on E-mail Communication Network Evolution Model Based on User Information Propagation
57		Google	Email evolution vs email revolution	30,800,000 results	

58			Email evolution vs email revolution meaning	21,200,000 results	Revolutionary vs. evolutionary organizational change
59					Revolution Not Evolution: How Cloud Computing Differs from Traditional IT and Why it Matters
60					The evolution and revolution of email
61					Relevancy, Reputation, and Engagement: The Evolution of E-mail Delivery Management
62		Science Direct	Email evolution	94,169 results	Clustering and classification of email contents
63					Capturing the evolution of corporate e-mail: An ethnographic case study
64		Library Catalog	Email vs letter		Letters, Postcards, Email : Technologies of Presence
65			Organizational behavior		Organizational Behavior : Managing People and Organization
66					Organizational Behavior
67			Content, context and structure		
68		Google	differences email attachment and letter attachment	34,600,000 results	"Enclosure" vs. "attachment" - English Language & Usage
69					Supplements to Legal Documents
70	09/10/2015	Google			USGS Correspondence Handbook
71		Google	email attachement limit	39,400,000 results	Email Attachment Size Limits For Gmail, Outlook, Yahoo
72					Did The Email Attachment Revolutionize Modern Communications?

73		Google	BCC vs CC in email	43,900,000 results	Bcc vs. Cc
74	11/10/2015	NORA	Email metadata	23,997 results	Intelligent email categorization based on textual information and metadata
75	13/10/2015	NORA	Letter meaning	1,298,303 results	
76					(COULDN'T ACCESS) Paper mail is here to stay
77	19/10/2015	NORA	Email envelope	71,064 results	
78		Google		81,300,000 results	About E-mail Envelopes
79					
80	25/10/2015	ACM	Letter +secretary	579 results	Secretary's letter: the role of ACM in standards
81	27/10/2015				Handwriting in the Age
82	29/10/2015				Pelestarian Seni Khat Sebagai Warisan Bangsa Melayu
83	01/11/2015				Modeling email use_a case of email system
84					RECORDS_REVIEW_-_Sir_Allex_Allan
85	05/11/2015				Garis Panduan Pengurusan Dan Pemeliharaan Mel Elektronik Sektor Awam
86					Dasar Penilaian dan Perolehan Rekod Awam ANM
87	06/11/2015				Akta 629
88	10/11/2015				Sejarah_dan_perkembangan_sistem_pentadbiran dan birokrasi di Malaysia
89					Panduan penyediaan klasifikasi fail
90					Rekod Elektronik & Akta Arkib Negara 2003
91	11/11/2015				KEHADIRAN BARAT DAN KESANNYA TERHADAP KESUSASTERAAN MELAYU
92					HubunganEtnikdiZamanKolonial
93					Kesan Kolonialisme Ke Atas Peradaban Melayu

94	12/11/2015				Fifty years of archives administration in Nigeria_lessons for the future
95					Perceived Records Management Practice and Decision making among university administrators in nigeria
96					Records management and national archives in Nigeria
97					Financial Records Systems in Nigeria
98					Electronic records management in Malaysia_ the need for an organisational and legal framework
99					GARIS PANDUAN PENGURUSAN REKOD ELEKTRONIK
100					PrasyaratPelaksanaanERMS
101	15/11/2015				TEMPLATE KLASIFIKASI URUSAN AM SEKTOR AWAM V9 (15052013)
102	16/11/2015				MALAY STUDIES – 50 YEARS ON
103					MUHAMMAD YUSOF AHMAD_A Pioneer of modern Malay Fiction
104	23/11/2015				Rethinking Formal Knowledge and its Practices in the Organization
105					functional_requirements for the sustainability of ER
106	28/11/2015				IRMT_Finan_CS_Nigeria
107					RM in Nigeria
108	29/11/2015				The Impact of Administrative Change on Record Keeping in Malawi
109					Registry
110					Department of Tresury
111	01/12/2015				recordsManagementManualScotland
112					Controlled Decentralised Filing_the alternative to the Registry

113					Records Management and Registry
114					RM REGISTRY PROCEDURE MANUAL
115	02/12/2015	LISA	Registry system in archive UK	9 results	A registry of archived electronic journals
116					The German Registry: The Evolution of a Recordkeeping Model
117					
118		Uitm Online database		8,872 results	The UK CF Registry – a successful transition to a web-based system
119					Establishing a global digital format registry
120					support for digital formats
121		IRMT			IRMT_strategic_planning
122					IRMT_organising
123					IRMT_manage_archives
124					IRMT_analyse_sys
125					IRMT_automating_rec_serv
126	07/12/2015				Computer forensics and records
127	07/01/2016				Finding aids in context_using Records Continuum
128	10/01/2016		Digital content		Strategies for managing digital contents formats
129					Digital content management_the search for a content management system
130					Digital content creation and copyright issues
131	11/01/2016	Google	Sir Alex report		Report_Sir Alex Allan_Digital_Records_Review
132	17/01/2016	Google	Continuum concept		continuumconcept monash
133		NAM	ERM guidelines		Guidelines_web_eng
134					Guidelines_structured_eng
135					Guidelines_unstructured_eng

136					Guidelines_ERM
137					Modelling the continuum as paradigm shift in recordkeeping
138		Google			What is a digital document_
139	04/02/2016	Mampu			MAMPU_chapter4_AUDITTRAIL
140	16/02/2016				Garis Panduan Pengurusan Dan Pemeliharaan Mel Elektronik Sektor Awam
141	17/02/2016	NORA	Email cloud	77,156 results	Conditional Identity-Based Broadcast Proxy Re-Encryption and Its Application to Cloud Email
142		ScienceDirect	Email in the cloud: the challenges and benefits	23 results	Email in the cloud: the challenges and benefits
143	19/02/2016	NORA	email cloud security	29,258 results	
144	22/02/2016	ScienceDirect	metadata of email	4,847 results	Using provenance to efficiently improve metadata searching performance in storage systems
145					Email-Statistics-Report-2015-2019-Executive-Summary
146	24/02/2016				INFORMATION SECURITY_Federal Guidance Needed to Address Control Issues with
147					Automated Electronic Records Management ReportPlan
148	21/04/2018	KKMM website	Dasar ICT	1	Dasar Keselamatan Teknologi Maklumat Dan Komunikasi (ICT)
149	18/04/2018	Online database	compliance vs culture	2935	Cultures of Compliance
150	21/04/2018	Online database	records management theory	39534	Towards a theoretical construct for records management
151					What will be the next records management orthodoxy?

152					Concepts and principles for the management of electronic records, or records management theory is archival diplomatics
153	22/04/2018	Online database	System Design	6,855,703	Requirements analysis and system design
154			Research ethics		
155			Information Culture	3,113,272	Information culture and organizational effectiveness
156	26/04/2018	Books	Roles in Project Management	2,135	Successful project and corporate management
157					Project management jumpstart
158					Project governance
159	27/04/2018	Online database	System usability scale	6112	
160		Online database	business analysis	212792	Business analysis : best practices for success
161		books	research ethics	82	
162		online database	quantitative research		
163		books	social research		<i>Social research methods</i>
164		Online database			applied social research
165		books			<i>What is this thing called science?</i>
166					Systematic combining: an abductive approach to case research
167					Beyond the two disciplines of scientific psychology
168					Progressive Focusing and Trustworthiness in Qualitative Research
169	28-Apr-18	Online database	email as evidence in government	380,606	

170		Google		389,000,000	Email Evidence Preservation: How to Balance the Obligation and the High Cost
171					Email as court evidence
172					Legal How-To: Using Email as Evidence
173		law database		0	-
174		eLaw case		1076	-

Appendix 2: Preliminary Questions

These questions were sent to the participants via email in advance of interviewing them. They are given in English and then the Malay translation is given which was used in the email message.

Information Management/ Policy

1. Does the ministry have an Information Management policy? Yes/No
Adakah pihak kementerian mempunyai polisi Pengurusan Maklumat?
2. Is it available to the public? Yes/No. If yes, can you please provide a copy?
Adakah polisi tersebut boleh didapati untuk tatapan umum? Jika ya, bolehkah saya mendapat salinan polisi tersebut?
3. Does the ministry have an Information Security policy? Yes/No
Adakah pihak kementerian mempunyai polisi Maklumat Keselamatan?
4. Is it available to the public? Yes/No. If yes, can you please provide a copy?
Adakah polisi tersebut boleh didapati untuk tatapan umum? Jika ya, bolehkah saya mendapat salinan polisi tersebut?
5. Does the ministry have a risk management committee? Yes/No.
Adakah pihak kementerian mempunyai Jawatankuasa Pengurusan Risiko? Ya/Tidak
6. Does the ministry have an internal audit committee?
Adakah pihak kementerian mempunyai jawatankuasa auditor dalaman?
7. If yes, does the committee have a program of work? Who agrees the audit committee's program of work?
Jika ya, adakah jawatankuasa mempunyai program kerja? Siapakah yang bersetuju dengan program kerja jawatankuasa audit?
8. Who in the ministry acts as internal auditor(s)? What role/position are they?
Siapakah di kementerian yang bertindak sebagai auditor dalaman? Apakah peranan dan kedudukan mereka di kementerian?
9. Does the ministry have external auditor? Who are they?
Adakah pihak kementerian mempunyai auditor luaran? Siapakah mereka?
10. Who gives advice on record keeping in the ministry?
Siapakah yang memberi nasihat dalam pengurusan dan penyimpanan rekod di kementerian?
Please state YES or NO to each of the following:
Sila nyatakan YA atau TIDAK di sebelah pilihan jawapan berikut:

- National Archives of Malaysia / Arkib Negara Malaysia
- MAMPU
- Internal auditor / Auditor dalaman
- External auditor / Auditor luaran
- Others. Please specify. / Lain-lain. Sila nyatakan.

11. What types of advice do they give?

Apakah jenis-jenis nasihat yang diberi?

Record Keeping Systems

1. Which of the following recordkeeping systems does the ministry use?

Antara berikut yang manakah jenis pengurusan dan penyimpanan rekod sistem yang digunakan di kementerian?

Please state YES or NO next to the following:

Sila nyatakan YA atau TIDAK di sebelah pilihan jawapan berikut:

- Paper registry system / Manual registri sistem
 - Electronic registry system / Elektronik registri sistem
 - EDRMS / Electronic Document and Records Management System
 - Others. Please specify / Lain-lain. Sila nyatakan.
2. Is there a registry system for paper records in the ministry? Yes/No
Adakah kementerian mempunyai registri sistem bagi 'paper' rekod?
 3. Is there a registry system for electronic records in the ministry? Yes/No
Adakah kementerian mempunyai registri sistem bagi elektronik rekod?
 4. Is there a file plan for paper records in the ministry? Yes/No
Adakah kementerian mempunyai pelan fail bagi 'paper' rekod? Ya/ Tidak
 5. Is there a file plan for electronic records in the ministry? Yes/No
Adakah kementerian mempunyai pelan fail bagi elektronik rekod? Ya/ Tidak

6. Which of the following systems are used to manage emails in the ministry?

Antara sistem berikut yang manakah yang digunakan bagi menguruskan emel di kementerian?

Please state YES or NO next to each of the following:

Sila nyatakan YA atau TIDAK di sebelah pilihan jawapan berikut:

- Email system / Emel sistem
- SharePoint
- EDRMS / Electronic Document and Records Management System
- Others. Please specify / Lain-lain. Sila nyatakan.

7. Does the ministry use any cloud services for managing any of its electronic records? Yes/No

Adakah kementerian menggunakan servis 'cloud' bagi pengurusan elektronik rekod? Ya/Tidak

NAM/MAMPU

1. In the context of managing government records what is the relationship and the respective roles of NAM and MAMPU?

Didalam konteks pengurusan rekod kerajaan apakah hubungan dan peranan di antara Arkib Negara Malaysia dan MAMPU?

2. Which policies and guidelines for managing government records does NAM/MAMPU have responsibility for?

Polisi dan garis panduan pengurusan rekod kerajaan manakah yang menjadi tanggungjawab Arkib Negara/MAMPU?

3. How were the policies for the government department developed?

Bagimanakah polisi bagi jabatan kerajaan dibangunkan?

4. How were the guidelines for the government department developed?

Bagimanakah garis panduan bagi jabatan kerajaan dibangunkan?

5. Some existing guidelines from NAM/MAMPU refer to selected benchmarking countries, other national/international bodies and research.

How does NAM/MAMPU identify those sources in developing the guidelines and policies?

Sebahagian garis panduan yang sedia ada oleh Arkib Negara Malaysia/ MAMPU merujuk kepada beberapa negara penanda aras, badan nasional atau internasional dan penyelidikan. Bagaimanakah Arkib Negara Malaysia/ MAMPU mengenalpasti sumber rujukan bagi membangunkan garis panduan dan polisi?

6. Who has responsibility for which policies and guidelines?

Siapakah yang bertanggungjawab bagi polisi dan garis panduan tersebut?

7. What is the role of NAM/MAMPU in the implementation of these policies and guidelines?

Apakah peranan Arkib Negara Malaysia/ MAMPU dalam pelaksanaan polisi dan garis panduan tersebut?

Please state YES or NO next to each of the following:

Sila nyatakan YA atau TIDAK di sebelah pilihan jawapan berikut:

- Providing training / Memberi khidmat latihan
- Providing awareness on the guidelines and policies / Memberi kesedaran bagi garis panduan dan polisi tersebut
- Monitoring or auditing the implementation of guidelines / Memantau atau audit pelaksanaan garis panduan
- Monitoring or auditing the implementation of policies / Memantau atau audit pelaksanaan polisi tersebut
- Seeking feedback from the implementation of the guidelines / Mencari maklum balas daripada pelaksanaan garis panduan
- Seeking feedback from the implementation of the policies / Mencari maklum balas daripada pelaksanaan polisi tersebut
- Other. Please specify. / Lain-lain. Sila nyatakan.
- None of the above / Tiada dalam senarai

8. What advice does NAM/MAMPU give in email?

Apakah bentuk nasihat yang diberikan oleh Arkib Negara Malaysia/ MAMPU bagi penggunaan dan pengurusan emel?

Please state YES/NO next to each of the following:

Sila nyatakan YA atau TIDAK di sebelah pilihan jawapan berikut:

- Provides awareness of the guidelines and policies / Memberi kesedaran bagi garis panduan dan polisi tersebut
- Provides training / Memberi khidmat latihan
- Monitors or audits the implementation of the guidelines / Memantau atau audit pelaksanaan garis panduan
- Monitors or audits the implementation of the policies / Memantau atau audit pelaksanaan polisi
- Seeks feedback from the implementation of the guidelines / Mencari maklum balas daripada pelaksanaan garis panduan
- Seeks feedback from the implementation of the policies / Mencari maklum balas daripada pelaksanaan polisi tersebut

- Does not give advice on email / Tidak memberi sebarang khidmat nasihat.
- Other. Please specify / Lain-lain. Sila nyatakan.

Appendix 3: Interview Questions adapted from the Records Continuum Model

							Notes :		
Vo.	Dimensional	Sub-Themes	Axes	Sources	Types of Questions	Methods of asking	E=Evidential		
I	Create	Create					T=Transactional		
		1. What records are created or produced in the ministry?	E,T,R	PIC	Opt (Optional)	E (Email)	R=Recordkeeping		
		2. Who is responsible in creating the email records in the ministry?	I	PIC	O (Open)	I (Interview)	I=Identity		
		3. How email record is created in the ministry?	I,E,T,R	PIC	O	I			
		4. Why email records are being created in the ministry instead of letter?	I,E,T,R	PIC	O	I			
		Documentation							
		1. How is the compliance and ethics function structured and integrated into the ministry?	I,R	HOD	O	I			
		2. Is the ministry compliance program effective?	I,R	HOD	CE	E			
		3. How often does the ministry conduct a risk assessment for significant threats?	I,R	HOD	O	I			
		4. How can the ministry's compliance policies be improved and better applied?	I,R	HOD	O	I			

3	Organize recordkeeping /Access								
		Record Keeping System							
		1. What kind of recordkeeping systems does the ministry use?	I	PIC	Y/N	E			
		2. Which of the following recordkeeping systems does the ministry use?	I	PIC	O	I			
		3. What is the name of record keeping systems used in the ministry?	I	PIC	Opt	E			
		4. Who is responsible in handling and managing the system?	I	PIC	O	E			
		5. How are email records managed in the ministry?	I	PIC	O	E			
		6. Does the ministry use any cloud services for managing electronic records?	I	PIC	Y/N	I			
		7. What are the knowledge and skills needed in handling and managing the system?	I	PIC	O	E			
		8. What are the specifications of hardware and software used in the system?	R	PIC	O	E			
		Arrangement							
		1. How is the email records arrange in the ministry?	E,T,R,I	PIC	O	E			
		2. How is the email records filing in the ministry?	E,T,R,I	Ope					
		3. Who is responsible in arranging the email records in the ministry?	I	PIC	O	E			
		Storage							
		1. How the email records have been stored in the ministry?	E,T,R,I	PIC+Ope	O	I			
		2. Who is responsible in managing and handling the storage?	I	PIC	O	I			
		3. What are the storage and format requirements in storing paper based and electronic records specifically email records?	T	PIC	O	I			
		4. What are the issues in storing the email records?	T,R	PIC	O	I			
		Classification							
		1. What is the classification used in managing the email records?	R	PIC+Ope	O	I			
		2. How classification of email records has been conducted in the ministry?	E,T,R,I	PIC+Ope	O	I			
		3. Who is responsible in classifying the email records in the ministry?	I	PIC	O	I			
		Access							
		1. Who can access to the email records?	I	PIC	O	E			
		Maintenance							
		1. Who is responsible in maintenance of email records in the ministry?	I	PIC	O	E			
		2. What are the strategies taken by the ministry in maintaining the digital content? (back-up/recovery, refreshment etc.)		PIC	O	I			
		3. What are the issues in maintaining the electronic record keeping system specifically email?	T,R	PIC	O	I			
		4. How frequent the maintaining of electronic record keeping system in the ministry?	I,R	PIC	OE	E			

Appendix 4: Example of Interview Guide

Name:	Date:
The purpose of this interview is to gather detailed information to be used as a case study in support of the Email Record Keeping in the Malaysian Government for PhD purpose. Interview will be recorded and consent form will be distributed before the interview start.	
Hi, thank you for your willingness to be a part of my research's respondent. First of all, could you please tell me about yourself, your education qualification, your working experience in the government sector and your current designation in the Ministry.	
Questions	Notes
Create	
1. What records are created or produced in the ministry? <i>Apakah rekod yang dicipta atau dihasilkan di kementerian?</i>	
2. Who is responsible in creating the email records in the ministry? <i>Siapakah yang bertanggungjawab dalam mencipta atau menghasilkan rekod di kementerian?</i>	
3. How email record is created in the ministry? <i>Bagaimanakah emel rekod dicipta di kementerian?</i>	
4. Why emails are being created in the ministry instead of letter? <i>Mengapakah kementerian menggunakan emel selain surat?</i>	
• HOD Documentation	
1. How is the compliance and ethics function structured and integrated into the ministry? <i>Bagaimanakah fungsi pematuhan dan etika yang berstruktur dan bersepadu ke dalam kementerian?</i>	
2. Is the ministry compliance program effective? <i>Adakah program pematuhan kementerian berkesan?</i>	
3. How often does the ministry conduct a risk assessment for significant threats? <i>Berapa kerap kementerian menjalankan penilaian risiko untuk mengelakkan ancaman?</i>	
4. How can the ministry's compliance policies be improved and better applied?	

<i>Bagaimanakah dasar pematuhan kementerian dipertingkatkan dan penggunaan yang lebih baik?</i>	
Capture	
1. How the email records been captured in the ministry? <i>Bagaimanakah emel rekod digunapakai atau ditawan di jabatan?</i>	
2. How the department capture the paper based and electronic format of record? <i>Bagaimanakah rekod-rekod jenis kertas dan elektronik digunapakai atau ditawan di jabatan?</i>	
3. How the connections between email records creation and capture are establish in the department? <i>Bagaimanakah hubungan antara penciptaan dan penggunapakai emel rekod dibangunkan di jabatan?</i>	
4. How to identify the email records as evidence in business process in the department? <i>Bagaimanakah emel rekod dikenalpasti sebagai bahan bukti didalam proses transaksi di jabatan?</i>	
5. Why email records are identified as evidence in the department? <i>Mengapakah emel rekod dikenalpasti sebagai bahan bukti di jabatan?</i>	
6. Who is responsible in capturing the email records in the department? <i>Siapakah yang bertanggungjawab dalam menggunapakai atau mengambil emel rekod di jabatan?</i>	
Tracking	
1. What is record tracking? <i>Apakah itu pengesanan rekod?</i>	
2. Is there any record tracking in the department? Why record tracking is perform in the department?	

Adakah jabatan mempunyai pengesanan rekod?Mengapakah pengesanan rekod dilakukan di jabatan?	
Registry	
1. Is there a registry system for paper records in the department? <i>Adakah jabatan mempunyai sistem registri bagi rekod kertas?</i>	
2. Is there a registry system for electronic records in the department? <i>Adakah jabatan mempunyai sistem registri bagi rekod elektronik?</i>	
3. What is the history and background of registry system in the department? <i>Apakah sejarah dan latar belakang sistem registri di jabatan?</i>	
4. What are the procedures involved in the registry process? How the procedures are taken? <i>Apakah prosedur yang terlibat didalam proses registri? Bagaimanakah prosedur tersebut dilakukan?</i>	
5. How the registry system reflects on the transition process from paper based to electronic records in the department? <i>Bagaimanakah sistem registri mengaitkan/menggambarkan proses peralihan daripada rekod kertas ke rekod elektronik di jabatan?</i>	
6. How the register list looks alike and how it assists in the audit trail in the department? <i>Bagaimanakah bentuk rupa senarai registri dan bagaimanakah senarai registri membantu dalam menjejak audit di jabatan?</i>	
7. What are the metadata (data represent) used in the registry system? <i>Apakah metadata yang digunakan di registri sistem?</i>	
8. Is there a file plan for paper records in the department?	

<i>Adakah jabatan mempunyai pelan fail bagi rekod kertas di jabatan?</i>	
9. Is there a file plan for electronic records in the department? <i>Adakah kementerian mempunyai pelan fail bagi rekod elektronik di jabatan?</i>	
10. How does the file plan relate to the registry system? <i>Bagaimanakah pelan fail dikaitkan dengan registri sistem?</i>	
11. If the registry has been abandoned when did this happen and what replaced it? <i>Jika registri telah ditinggalkan, bilakah ia berlaku dan apakah yang menggantikannya?</i>	
12. Why the registry has been abandoned? (rely on answer from Q10) <i>Mengapakah ia berlaku?</i>	
13. What is the classification scheme used in organizing the records in registry? <i>Apakah skema klasifikasi yang digunakan dalam menyusun rekod-rekod di registri?</i>	
Record Keeping System	
1. What kind of recordkeeping systems does the department use? <i>Apakah jenis sistem penyimpanan rekod yang digunakan di jabatan?</i>	
2. Which of the following recordkeeping systems does the department use? <i>Antara berikut yang manakah jenis pengurusan dan penyimpanan rekod sistem yang digunakan di jabatan?</i> <ul style="list-style-type: none"> • Paper registry system / Manual registri sistem • Electronic registry system / Elektronik registri sistem • EDRMS / Electronic Document and Records Management System 	

<ul style="list-style-type: none"> Others. Please specify / Lain-lain. Sila nyatakan. 	
3. What is the name of record keeping systems used in the department? <i>Apakah nama sistem penyimpanan rekod yang digunakan di jabatan?</i>	
4. Who is responsible in handling and managing the system? <i>Siapakah yang bertanggungjawab dalam mengendalikan dan menguruskan sistem tersebut?</i>	
5. How email records are managed in the department? <i>Bagaimanakah emel rekod diuruskan di jabatan?</i>	
6. Does the department use any cloud services for managing electronic records? <i>Adakah jabatan menggunakan perkhidmatan 'cloud' bagi menguruskan rekod elektronik?</i>	
7. What are the knowledge and skills needed in handling and managing the system? <i>Apakah pengetahuan dan kemahiran yang diperlukan bagi mengendalikan dan menguruskan sistem tersebut?</i>	
8. What are the specifications of hardware and software used in the system? <i>Apakah spesifikasi perkakasan dan perisian yang digunakan bagi sistem tersebut?</i>	
Arrangement	
1. How is the email records been arranged in the department? <i>Bagaimanakah emel rekod disusun di jabatan?</i>	
2. How the email records filing in the department? <i>Bagaimanakah emel rekod difailkan di jabatan?</i>	
3. Who is responsible in arranging the email records in the department? <i>Siapakah yang bertanggungjawab dalam menyusun emel rekod di jabatan?</i>	
Storage	

1. How the email records have been stored in the department? <i>Bagaimanakah emel rekod disimpan di jabatan?</i>	
2. Who is responsible in managing and handling the storage? <i>Siapakah yang bertanggungjawab dalam menguruskan dan mengendalikan pusat penyimpanan tersebut?</i>	
3. What are the format requirements in storing paper based and electronic records in the department? <i>Apakah keperluan format yang diperlukan bagi menyimpan rekod kertas dan rekod elektronik di jabatan?</i>	
4. What are the issues in storing the email records? <i>Apakah isu dalam penyimpanan emel rekod?</i>	
Classification	
1. What is the classification used in managing the email records in the department? <i>Apakah klasifikasi yang digunakan dalam menguruskan emel rekod di jabatan?</i>	
2. How classification of email records has been conducted in the department? <i>Bagaimanakah klasifikasi emel rekod dilakukan di jabatan?</i>	
3. Who is responsible in classifying the email records in the department? <i>Siapakah yang bertanggungjawab dalam mengklasifikasikan emel rekod di jabatan?</i>	
Access	
1. Who can access to the email records in the department? <i>Siapakah yang boleh mengakses emel rekod di jabatan?</i>	
Maintenance	
1. Who is responsible in maintenance of email records in the department? <i>Siapakah yang bertanggungjawab dalam penyelenggaraan emel rekod di jabatan?</i>	

2. What are the strategies taken by the department and the ministry in maintaining the digital content? (back-up/recovery, refreshment etc.) <i>Apakah strategi yang dilakukan oleh jabatan ataupun kementerian dalam menyelenggara kandungan digital?</i>	
3. What are the issues in maintaining the electronic record keeping system specifically email in the department? <i>Apakah isu dalam menyelenggara sistem penyimpanan rekod elektronik khususnya emel di jabatan?</i>	
4. How frequent the maintaining of electronic record keeping system in the department? <i>Berapakah kekerapan proses penyelenggaraan sistem penyimpanan rekod elektronik di jabatan?</i>	
Information Management Policies/ Guidelines/Risk	
1. Does the ministry have an Information Management policy? Yes/No 2. Is it available to the public? Yes/No. If yes, can you please provide a copy? <i>Adakah pihak kementerian mempunyai polisi Pengurusan Maklumat? Adakah polisi tersebut boleh didapati untuk tatapan umum? Jika ya, bolehkah saya mendapat salinan polisi tersebut?</i>	
2. Does the ministry have an Information Security policy? Yes/No 4. Is it available to the public? Yes/No. If yes, can you please provide a copy? <i>Adakah pihak kementerian mempunyai polisi Maklumat Keselamatan? Adakah polisi tersebut boleh didapati untuk tatapan umum? Jika ya, bolehkah saya mendapat salinan polisi tersebut?</i>	
3. Does the ministry have a risk management committee? Yes/No. <i>Adakah pihak kementerian mempunyai Jawatankuasa Pengurusan Risiko? Ya/Tidak</i>	

4. Does the ministry have an internal audit committee? 7. If yes, does the committee have a program of work? Who agrees the audit committee's program of work? <i>Adakah pihak kementerian mempunyai jawatankuasa auditor dalaman? Jika ya, adakah jawatankuasa mempunyai program kerja? Siapakah yang bersetuju dengan program kerja jawatankuasa audit?</i>	
5. Does the ministry have external auditor? Who are they? <i>Adakah pihak kementerian mempunyai auditor luaran? Siapakah mereka?</i>	
6. Who in the ministry acts as internal auditor(s)? What role/position are they? <i>Siapakah di kementerian yang bertindak sebagai auditor dalaman? Apakah peranan dan kedudukan mereka di kementerian?</i>	
7. Does the ministry have risk register? <i>Adakah kementerian mempunyai pendaftaran risiko?</i>	
8. Is information on the risk register? <i>Adakah maklumat di daftarkan sebagai risiko?</i>	
9. Who gives advice on record keeping in the ministry? <i>Siapakah yang memberi nasihat dalam pengurusan dan penyimpanan rekod di kementerian?</i>	
10. What types of advice do they give? <i>Apakah jenis-jenis nasihat yang diberi?</i>	
11. What are the policies in managing electronic records specifically email in the ministry? <i>Apakah polisi bagi menguruskan elektronik rekod khususnya emel di kementerian?</i>	
12. What are the guidelines in managing electronic records specifically email in the ministry? <i>Apakah garis panduan yang digunakan bagi menguruskan elektronik rekod khususnya emel di kementerian?</i>	

Appendix 5 Interview Questions for PIC

Create	Notes
5. What records are created or produced in the ministry? <i>Apakah rekod yang dicipta atau dihasilkan di kementerian?</i>	
6. Who is responsible in creating the email records in the ministry? <i>Siapakah yang bertanggungjawab dalam mencipta atau menghasilkan rekod di kementerian?</i>	
7. How email record is created in the ministry? <i>Bagaimanakah emel rekod dicipta di kementerian?</i>	
8. Why emails are being created in the ministry instead of letter? <i>Mengapakah kementerian menggunakan emel selain surat?</i>	
• HOD Documentation	
5. How is the compliance and ethics function structured and integrated into the ministry? <i>Bagaimanakah fungsi pematuhan dan etika yang berstruktur dan bersepadu ke dalam kementerian?</i>	
6. Is the ministry compliance program effective? <i>Adakah program pematuhan kementerian berkesan?</i>	
7. How often does the ministry conduct a risk assessment for significant threats? <i>Berapa kerap kementerian menjalankan penilaian risiko untuk mengelakkan ancaman?</i>	
8. How can the ministry's compliance policies be improved and better applied? <i>Bagaimanakah dasar pematuhan kementerian dipertingkatkan dan penggunaan yang lebih baik?</i>	
Capture	
7. How the email records been captured in the ministry? <i>Bagaimanakah emel rekod digunapakai atau ditawan di jabatan?</i>	

8. How the department capture the paper based and electronic format of record? <i>Bagaimanakah rekod-rekod jenis kertas dan elektronik digunakan atau ditawan di jabatan?</i>	
9. How the connections between email records creation and capture are establish in the department? <i>Bagaimanakah hubungan antara penciptaan dan penggunapakai emel rekod dibangunkan di jabatan?</i>	
10. How to identify the email records as evidence in business process in the department? <i>Bagaimanakah emel rekod dikenalpasti sebagai bahan bukti didalam proses transaksi di jabatan?</i>	
11. Why email records are identified as evidence in the department? <i>Mengapakah emel rekod dikenalpasti sebagai bahan bukti di jabatan?</i>	
12. Who is responsible in capturing the email records in the department? <i>Siapakah yang bertanggungjawab dalam menggunakan atau mengambil emel rekod di jabatan?</i>	
Tracking	
3. What is record tracking? <i>Apakah itu pengesanan rekod?</i>	
4. Is there any record tracking in the department? Why record tracking is perform in the department? <i>Adakah jabatan mempunyai pengesanan rekod?Mengapakah pengesanan rekod dilakukan di jabatan?</i>	
Registry	
14. Is there a registry system for paper records in the department? <i>Adakah jabatan mempunyai sistem registri bagi rekod kertas?</i>	

15. Is there a registry system for electronic records in the department? <i>Adakah jabatan mempunyai sistem registri bagi rekod elektronik?</i>	
16. What is the history and background of registry system in the department? <i>Apakah sejarah dan latar belakang sistem registri di jabatan?</i>	
17. What are the procedures involved in the registry process? How the procedures are taken? <i>Apakah prosedur yang terlibat didalam proses registri? Bagaimanakah prosedur tersebut dilakukan?</i>	
18. How the registry system reflects on the transition process from paper based to electronic records in the department? <i>Bagaimanakah sistem registri mengaitkan/menggambarkan proses peralihan daripada rekod kertas ke rekod elektronik di jabatan?</i>	
19. How the register list looks alike and how it assists in the audit trail in the department? <i>Bagaimanakah bentuk rupa senarai registri dan bagaimanakah senarai registri membantu dalam menjejak audit di jabatan?</i>	
20. What are the metadata (data represent) used in the registry system? <i>Apakah metadata yang digunakan di registri sistem?</i>	
21. Is there a file plan for paper records in the department? <i>Adakah jabatan mempunyai pelan fail bagi rekod kertas di jabatan?</i>	
22. Is there a file plan for electronic records in the department? <i>Adakah kementerian mempunyai pelan fail bagi rekod elektronik di jabatan?</i>	
23. How does the file plan relate to the registry system? <i>Bagaimanakah pelan fail dikaitkan dengan registri sistem?</i>	

24. If the registry has been abandoned when did this happen and what replaced it? <i>Jika registri telah ditinggalkan, bilakah ia berlaku dan apakah yang menggantikannya?</i>	
25. Why the registry has been abandoned? (rely on answer from Q10) <i>Mengapakah ia berlaku?</i>	
26. What is the classification scheme used in organizing the records in registry? <i>Apakah skema klasifikasi yang digunakan dalam menyusun rekod-rekod di registri?</i>	
Record Keeping System	
9. What kind of recordkeeping systems does the department use? <i>Apakah jenis sistem penyimpanan rekod yang digunakan di jabatan?</i>	
10. Which of the following recordkeeping systems does the department use? <i>Antara berikut yang manakah jenis pengurusan dan penyimpanan rekod sistem yang digunakan di jabatan?</i> <ul style="list-style-type: none"> • Paper registry system / Manual registri sistem • Electronic registry system / Elektronik registri sistem • EDRMS / Electronic Document and Records Management System • Others. Please specify / Lain-lain. Sila nyatakan. 	
11. What is the name of record keeping systems used in the department? <i>Apakah nama sistem penyimpanan rekod yang digunakan di jabatan?</i>	
12. Who is responsible in handling and managing the system?	

<i>Siapakah yang bertanggungjawab dalam mengendalikan dan menguruskan sistem tersebut?</i>	
13. How email records are managed in the department? <i>Bagaimanakah emel rekod diuruskan di jabatan?</i>	
14. Does the department use any cloud services for managing electronic records? <i>Adakah jabatan menggunakan perkhidmatan 'cloud' bagi menguruskan rekod elektronik?</i>	
15. What are the knowledge and skills needed in handling and managing the system? <i>Apakah pengetahuan dan kemahiran yang diperlukan bagi mengendalikan dan menguruskan sistem tersebut?</i>	
16. What are the specifications of hardware and software used in the system? <i>Apakah spesifikasi perkakasan dan perisian yang digunakan bagi sistem tersebut?</i>	
Arrangement	
4. How is the email records been arranged in the department? <i>Bagaimanakah emel rekod disusun di jabatan?</i>	
5. How the email records filing in the department? <i>Bagaimanakah emel rekod difailkan di jabatan?</i>	
6. Who is responsible in arranging the email records in the department? <i>Siapakah yang bertanggungjawab dalam menyusun emel rekod di jabatan?</i>	
Storage	
5. How the email records have been stored in the department? <i>Bagaimanakah emel rekod disimpan di jabatan?</i>	
6. Who is responsible in managing and handling the storage? <i>Siapakah yang bertanggungjawab dalam menguruskan dan mengendalikan pusat penyimpanan tersebut?</i>	
7. What are the format requirements in storing paper based and electronic records in the department?	

<i>Apakah keperluan format yang diperlukan bagi menyimpan rekod kertas dan rekod elektronik di jabatan?</i>	
8. What are the issues in storing the email records? <i>Apakah isu dalam penyimpanan emel rekod?</i>	
Classification	
4. What is the classification used in managing the email records in the department? <i>Apakah klasifikasi yang digunakan dalam menguruskan emel rekod di jabatan?</i>	
5. How classification of email records has been conducted in the department? <i>Bagaimanakah klasifikasi emel rekod dilakukan di jabatan?</i>	
6. Who is responsible in classifying the email records in the department? <i>Siapakah yang bertanggungjawab dalam mengklasifikasikan emel rekod di jabatan?</i>	
Access	
2. Who can access to the email records in the department? <i>Siapakah yang boleh mengakses emel rekod di jabatan?</i>	
Maintenance	
5. Who is responsible in maintenance of email records in the department? <i>Siapakah yang bertanggungjawab dalam penyelenggaraan emel rekod di jabatan?</i>	
6. What are the strategies taken by the department and the ministry in maintaining the digital content? (back-up/recovery, refreshment etc.) <i>Apakah strategi yang dilakukan oleh jabatan ataupun kementerian dalam menyelenggara kandungan digital?</i>	
7. What are the issues in maintaining the electronic record keeping system specifically email in the department? <i>Apakah isu dalam menyelenggara sistem penyimpanan rekod elektronik khususnya emel di jabatan?</i>	

8. How frequent the maintaining of electronic record keeping system in the department? <i>Berapakah kekerapan proses penyelenggaraan sistem penyimpanan rekod elektronik di jabatan?</i>	
Information Management Policies/ Guidelines/Risk	
13. Does the ministry have an Information Management policy? Yes/No 2. Is it available to the public? Yes/No. If yes, can you please provide a copy? <i>Adakah pihak kementerian mempunyai polisi Pengurusan Maklumat? Adakah polisi tersebut boleh didapati untuk tatapan umum? Jika ya, bolehkah saya mendapat salinan polisi tersebut?</i>	
14. Does the ministry have an Information Security policy? Yes/No 4. Is it available to the public? Yes/No. If yes, can you please provide a copy? <i>Adakah pihak kementerian mempunyai polisi Maklumat Keselamatan? Adakah polisi tersebut boleh didapati untuk tatapan umum? Jika ya, bolehkah saya mendapat salinan polisi tersebut?</i>	
15. Does the ministry have a risk management committee? Yes/No. <i>Adakah pihak kementerian mempunyai Jawatankuasa Pengurusan Risiko? Ya/Tidak</i>	
16. Does the ministry have an internal audit committee? 7. If yes, does the committee have a program of work? Who agrees the audit committee's program of work? <i>Adakah pihak kementerian mempunyai jawatankuasa auditor dalaman? Jika ya, adakah jawatankuasa mempunyai program kerja? Siapakah yang bersetuju dengan program kerja jawatankuasa audit?</i>	
17. Does the ministry have external auditor? Who are they? <i>Adakah pihak kementerian mempunyai auditor luaran? Siapakah mereka?</i>	

18. Who in the ministry acts as internal auditor(s)? What role/position are they? <i>Siapakah di kementerian yang bertindak sebagai auditor dalaman? Apakah peranan dan kedudukan mereka di kementerian?</i>	
19. Does the ministry have risk register? <i>Adakah kementerian mempunyai pendaftaran risiko?</i>	
20. Is information on the risk register? <i>Adakah maklumat di daftarkan sebagai risiko?</i>	
21. Who gives advice on record keeping in the ministry? <i>Siapakah yang memberi nasihat dalam pengurusan dan penyimpanan rekod di kementerian?</i>	
22. What types of advice do they give? <i>Apakah jenis-jenis nasihat yang diberi?</i>	
23. What are the policies in managing electronic records specifically email in the ministry? <i>Apakah polisi bagi menguruskan elektronik rekod khususnya emel di kementerian?</i>	
24. What are the guidelines in managing electronic records specifically email in the ministry? <i>Apakah garis panduan yang digunakan bagi menguruskan elektronik rekod khususnya emel di kementerian?</i>	

Appendix 6: Interview Questions for Operational Staff

Create	Notes
1. What records are created or produced in the department? <i>Apakah rekod yang dicipta atau dihasilkan di jabatan?</i>	
2. How email record is created in the department? <i>Bagaimanakah emel rekod dicipta di jabatan?</i>	
3. Why emails are being created in the department instead of letter? <i>Mengapakah jabatan menggunakan emel selain surat?</i>	
Capture	

1. How the email records been captured in the department? Bagaimanakah emel rekod digunapakai atau ditawan di jabatan?	
2. How the department capture the paper based and electronic format of record? Bagaimanakah rekod-rekod jenis kertas dan elektronik digunapakai atau ditawan di jabatan?	
3. How to identify the email records as evidence in business process? Bagaimanakah emel rekod dikenalpasti sebagai bahan bukti didalam proses transaksi di jabatan?	
4. Why email records are identified as evidence in the department? Mengapakah emel rekod dikenalpasti sebagai bahan bukti di jabatan?	
5. Who is responsible in capturing the email records in the department? Siapakah yang bertanggungjawab dalam menggunakan atau mengambil emel rekod di jabatan?	
Tracking	
1. What is record tracking? Apakah itu pengesanan rekod?	
2. Is there any record tracking in the department? Why record tracking is perform in the department? Adakah jabatan mempunyai pengesanan rekod? Mengapakah pengesanan rekod dilakukan di jabatan?	
Registry	
1. Is there a registry system for paper records in the department? Adakah jabatan mempunyai sistem registri bagi rekod kertas?	
2. Is there a registry system for electronic records in the department? Adakah jabatan mempunyai sistem registri bagi rekod elektronik?	

3. What are the metadata (data represent) used in the registry system? Apakah metadata yang digunakan di registri sistem?	
4. What is the classification scheme used in organizing the records in registry? Apakah skema klasifikasi yang digunakan dalam menyusun rekod-rekod di registri?	
Record Keeping System	
1. What kind of recordkeeping systems does the department use? Apakah jenis sistem penyimpanan rekod yang digunakan di jabatan?	
2. Which of the following recordkeeping systems does the department use? <ul style="list-style-type: none"> • Antara berikut yang manakah jenis pengurusan dan penyimpanan rekod sistem yang digunakan di jabatan? • Paper registry system / Manual registri sistem • Electronic registry system / Elektronik registri sistem • EDRMS / Electronic Document and Records Management System • Others. Please specify / Lain-lain. Sila nyatakan. 	
3. Who is responsible in handling and managing the system? Siapakah yang bertanggungjawab dalam mengendalikan dan menguruskan sistem tersebut?	
4. How email records are managed in the department? Bagaimanakah emel rekod diuruskan di jabatan ini?	
5. Which of the following systems are used to manage emails in the department? Antara sistem berikut yang manakah yang digunakan bagi menguruskan emel di jabatan? <ul style="list-style-type: none"> • Email system / Emel sistem • SharePoint • EDRMS / Electronic Document and Records Management System • Others. Please specify / Lain-lain. Sila nyatakan. 	

6. Does the department use any cloud services for managing electronic records? Adakah jabatan menggunakan perkhidmatan 'cloud' bagi menguruskan rekod elektronik?	
Arrangement	
1. How is the email records been arranged in the department? Bagaimanakah emel rekod disusun di jabatan?	
2. How the email records filing in the department? Bagaimanakah emel rekod difailkan di jabatan?	
3. Who is responsible in arranging the email records in the department? Siapakah yang bertanggungjawab dalam menyusun emel rekod di jabatan?	
Storage	
1. How the email records have been stored in the department? Bagaimanakah emel rekod disimpan di jabatan?	
2. Who is responsible in managing and handling the storage? Siapakah yang bertanggungjawab dalam menguruskan dan mengendalikan pusat penyimpanan tersebut?	
3. What are the format requirements in storing paper based and electronic records in the department? Apakah keperluan format yang diperlukan bagi menyimpan rekod kertas dan rekod elektronik di jabatan?	
Classification	
1. What is the classification used in managing the email records in the department? Apakah klasifikasi yang digunakan dalam menguruskan emel rekod di jabatan?	
2. How classification of email records has been conducted in the department? Bagaimanakah klasifikasi emel rekod dilakukan di jabatan?	
Access	

1. Who can access to the email records in the department? Siapakah yang boleh mengakses emel rekod di jabatan?	
Maintenance	
1. Who is responsible in maintenance of email records in the department? Siapakah yang bertanggungjawab dalam penyelenggaraan emel rekod di jabatan?	

Appendix 7: Interview Questions for NAM

- 1) What are the policies or guidelines used in managing electronic email records specifically email in the ministry?
Polisi dan garis panduan manakah yang digunakan bagi pengurusan elektronik rekod khususnya email di kementerian?
- 2) Who is responsible to develop the policies and guidelines?
Siapakah yang bertanggungjawab dalam membangunkan polisi dan garis panduan?
- 3) How well the used of policies and guidelines in the ministry in Malaysia?
Sejauh mana polisi dan garis panduan dipraktikkan oleh kementerian di Malaysia?
- 4) Who is responsible in approving the policies and guidelines?
Siapakah yang bertanggungjawab dalam meluluskan polisi dan garis panduan tersebut?
- 5) How long does it takes to complete a policy and guideline?
Berapa masa yang diperlukan bagi menyempurnakan polisi dan garis panduan yang dibangunkan?
- 6) What are the barriers in implementing the policies and guidelines in ministry?
Apakah halangan atau kekangan dalam melaksanakan polisi dan garis panduan di kementerian?
- 7) What are the policies in managing electronic records specifically email in the ministry?
Apakah polisi bagi menguruskan elektronik rekod khususnya emel di kementerian?
- 8) What are the guidelines in managing electronic records specifically email in the ministry?
Apakah garis panduan yang digunakan bagi menguruskan elektronik rekod khususnya emel di kementerian?
- 9) What is e-Spark and what is the role of e-Spark in implementing the records management in Malaysia specifically in public sector?
Apakah itu e-Spark dan apakah peranan e-Spark dalam melaksanakan pengurusan rekod di Malaysia khususnya di sector kerajaan?
- 10) According to the Guideline of Managing Electronic Records which produced by National Archives of Malaysia mentioned the implementation of EDRMS is to ensure the electronic records management is effective. How far is the implementation and application of EDRMS in government sector specifically in managing email records?
Merujuk kepada Garis panduan Dasar Pengurusan Rekod Elektronik yang disediakan oleh ANM, ada dimaklumkan pelaksanaan EDRMS bagi pengurusan rekod elektronik yang efektif. Sejauhmanakah, pelaksanaan dan penggunaan EDRSM dalam sector kerajaan khususnya dalam pengurusan emel rekod?
- 11) What is the function and role of National Archives of Malaysia in managing registry in government sector?
Apakah fungsi dan peranan Arkib Negara Malaysia dalam pengurusan registri di jabatan kerajaan?

Appendix 8: Interview Questions for MAMPU

1. What are the policies or guidelines used in managing electronic email records specifically email in the government department?
Polisi dan garis panduan manakah yang digunakan bagi pengurusan elektronik rekod khususnya email di jabatan kerajaan?
2. Who is responsible to develop the policies and guidelines?
Siapakah yang bertanggungjawab dalam membangunkan polisi dan garis panduan tersebut?
3. How well the used of policies and guidelines in the government department in Malaysia?
Sejauhmana polisi dan garis panduan dipraktikkan oleh jabatan kerajaan di Malaysia?
4. Who is responsible in approving the policies and guidelines?
Siapakah yang bertanggungjawab dalam meluluskan polisi dan garis panduan tersebut?
5. How long does it takes to complete a policy and guideline?
Berapakah masa yang diperlukan bagi menyempurnakan polisi dan garis panduan yang dibangunkan?
6. What are the barriers in implementing the policies and guidelines in government department?
Apakah halangan atau kekangan dalam melaksanakan polisi dan garis panduan di jabatan kerajaan?
7. What are the policies in managing electronic records specifically email in the government department?
Apakah polisi bagi menguruskan elektronik rekod khususnya emel di jabatan kerajaan?
8. What are the guidelines in managing electronic records specifically email in the government department?
Apakah garis panduan yang digunakan bagi menguruskan elektronik rekod khususnya emel di jabatan kerajaan?
9. What is DDMS (Digital Document Management System) and what is the role of DDMS in implementing the email records management in Malaysia specifically in public sector?
Apakah itu DDMS dan apakah peranan DDMS dalam melaksanakan pengurusan emel rekod di Malaysia khususnya di sektor kerajaan?
10. How far is the implementation and application of DDMS in government sector specifically in managing email records?
Sejauh manakah, pelaksanaan dan penggunaan DDMS dalam sektor kerajaan khususnya dalam pengurusan emel rekod?
11. What is 1GovUC and what is the function and role of 1GovUC in managing email records in the government sector?
Apakah itu 1GovUC dan apakah fungsi dan peranan 1GovUC dalam pengurusan email records di jabatan kerajaan?
12. What is the relationship between DDMS and 1GovUC?
Apakah hubungan antara DDMS dan 1GovUC?

Appendix 9: Example of Interview notes

Interview notes used during interview session to help researcher conducts a preliminary analysis. Appendix 9 is only an example of interview notes during an interview with PIC1D1 that has been transferred from handwritten to appropriate format.

Create	PIC	Notes
9. What records are created or produced in the ministry? <i>Apakah rekod yang dicipta atau dihasilkan di kementerian?</i>	<ul style="list-style-type: none"> • Written(Paper) • Electronic • WhatsApp 	
10. Who is responsible in creating the email records in the ministry? <i>Siapakah yang bertanggungjawab dalam mencipta atau menghasilkan rekod di kementerian?</i>	<ul style="list-style-type: none"> • Officer • Clerk (not giving an implication) 	
11. How email record is created in the ministry? <i>Bagaimanakah emel rekod dicipta di kementerian?</i>	<ul style="list-style-type: none"> • Inward • Outward (Both print and file) <p>The records here is following hierarchy from top to bottom management</p>	The email record is created based on the command from the top management and will be disseminate to the lower management for further action.
12. Why emails are being created in the ministry instead of letter? <i>Mengapakah kementerian menggunakan emel selain surat?</i>	<ul style="list-style-type: none"> • Efficient • Fast • Immediate respond 	Effective and efficiency
• HOD Documentation		
9. How is the compliance and ethics function structured and integrated into the ministry? <i>Bagaimanakah fungsi pematuhan dan etika yang berstruktur dan bersepadu ke dalam kementerian?</i>	None	
10. Is the ministry compliance program effective? <i>Adakah program pematuhan kementerian berkesan?</i>	None	
11. How often does the ministry conduct a risk assessment for significant threats? <i>Berapa kerap kementerian menjalankan penilaian risiko untuk mengelakkan ancaman?</i>	Never at this specific department	
12. How can the ministry's compliance policies be improved and better applied? <i>Bagaimanakah dasar pematuhan kementerian dipertingkatkan dan penggunaan yang lebih baik?</i>	File the documents that have in DDMS	
Capture		

13. How the email records been captured in the department? <i>Bagaimanakah emel rekod digunapakai atau ditawan di jabatan?</i>	<ul style="list-style-type: none"> Received email: evaluate and determine if the email needs to be captured or not. The evaluation process it depends on the contents and the designation or authority of the sender 	The email records will be captured based on the top management decision.
14. How the department capture the paper based and electronic format of record? <i>Bagaimanakah rekod-rekod jenis kertas dan elektronik digunapakai atau ditawan di jabatan?</i>	It depends on consideration or judgement Chief Clerk : captured as proof or references	
15. How the connections between email records creation and capture are establish in the department? <i>Bagaimanakah hubungan antara penciptaan dan penggunapakai emel rekod dibangunkan di jabatan?</i>	Print and file	
16. How to identify the email records as evidence in business process in the department? <i>Bagaimanakah emel rekod dikenalpasti sebagai bahan bukti didalam proses transaksi di jabatan?</i>	DDMS can't be identified but if email has been printed and file in a physical file, it can be as evidence.	DDMS has been not acceptable as an evidence. Only accepting printing email records as evidence.
17. Why email records are identified as evidence in the department? <i>Mengapakah emel rekod dikenalpasti sebagai bahan bukti di jabatan?</i>	As one of formal document	
18. Who is responsible in capturing the email records in the department? <i>Siapakah yang bertanggungjawab dalam menggunapakai atau mengambil emel rekod di jabatan?</i>	Each individual	
Tracking		
5. What is record tracking? <i>Apakah itu pengesanan rekod?</i>	System record file. The function is to search for the record	Record tracking as an audit trail.
6. Is there any record tracking in the department? Why record tracking is performing in the department? <i>Adakah jabatan mempunyai pengesanan rekod?Mengapakah pengesanan rekod dilakukan di jabatan?</i>	Yes. For references	
Registry		
27. Is there a registry system for paper records in the department? <i>Adakah jabatan mempunyai sistem registri bagi rekod kertas?</i>	Yes.	
28. Is there a registry system for electronic records in the department? <i>Adakah jabatan mempunyai sistem registri bagi rekod elektronik?</i>	Not sure.	
29. What is the history and background of registry system in the department? <i>Apakah sejarah dan latar belakang sistem registri di jabatan?</i>	Centralize. However, the interviewee suggest to have a	

	decentralize registry at each department or section.	
30. What are the procedures involved in the registry process? How the procedures are taken? <i>Apakah prosedur yang terlibat didalam proses registri? Bagaimanakah prosedur tersebut dilakukan?</i>	Received letter Numbering the letter Filing Clerk open DDMS and refer the suitable reference number Make a copy Original send to receiver and copy keep in a file	
31. How the registry system reflects on the transition process from paper based to electronic records in the department? <i>Bagaimanakah sistem registri mengaitkan/menggambarkan proses peralihan daripada rekod kertas ke rekod elektronik di jabatan?</i>	Paperless Centralize The negative effects: <ul style="list-style-type: none"> Cannot trace the paper records. (The interviewee referring to DDMS) 	
32. How the register list looks alike and how it assists in the audit trail in the department? <i>Bagaimanakah bentuk rupa senarai registri dan bagaimanakah senarai registri membantu dalam menjejak audit di jabatan?</i>	The interviewee said the list is at the clerk. (From observation, she doesn't familiar with the list)	
33. What are the metadata (data represent) used in the registry system? <i>Apakah metadata yang digunakan di registri sistem?</i>	<ul style="list-style-type: none"> Reference Number Date Letterhead 	Inconsistent of metadata
34. Is there a file plan for paper records in the department? <i>Adakah jabatan mempunyai pelan fail bagi rekod kertas di jabatan?</i>	No	
35. Is there a file plan for electronic records in the department? <i>Adakah kementerian mempunyai pelan fail bagi rekod elektronik di jabatan?</i>	No	
36. How does the file plan relate to the registry system? <i>Bagaimanakah pelan fail dikaitkan dengan registri sistem?</i>	N/A	
37. If the registry has been abandoned when did this happen and what replaced it? <i>Jika registri telah ditinggalkan, bilakah ia berlaku dan apakah yang menggantikannya?</i>	There is a registry; however, the classification is too general. The reference number will be created if the record is actively used.	
38. Why the registry has been abandoned? (rely on answer from Q10) <i>Mengapakah ia berlaku?</i>	N/A	

39. What is the classification scheme used in organizing the records in registry? <i>Apakah skema klasifikasi yang digunakan dalam menyusun rekod-rekod di registri?</i>	Chronological order (From latest to the previous)	
Record Keeping System		
17. What kind of recordkeeping systems does the department use? <i>Apakah jenis sistem penyimpanan rekod yang digunakan di jabatan?</i>	Electronic and paper based. DDMS (However, not all records capture in DDMS)	
18. Which of the following recordkeeping systems does the department use? <i>Antara berikut yang manakah jenis pengurusan dan penyimpanan rekod sistem yang digunakan di jabatan?</i> <ul style="list-style-type: none"> • Paper registry system / Manual registri sistem • Electronic registry system / Elektronik registri sistem • EDRMS / Electronic Document and Records Management System • Others. Please specify / Lain-lain. Sila nyatakan. 	<ul style="list-style-type: none"> • Paper registry system • Electronic registry system 	
19. What is the name of record keeping systems used in the department? <i>Apakah nama sistem penyimpanan rekod yang digunakan di jabatan?</i>	DDMS	
20. Who is responsible in handling and managing the system? <i>Siapakah yang bertanggungjawab dalam mengendalikan dan menguruskan sistem tersebut?</i>	2 administrative clerks 1 officer	
21. How email records are managed in the department? <i>Bagaimanakah emel rekod diuruskan di jabatan?</i>	Print and email	No standard guidelines in managing email records in this department.
22. Which of the following systems are used to manage emails in the department? <i>Antara sistem berikut yang manakah yang digunakan bagi menguruskan emel di jabatan?</i> <ul style="list-style-type: none"> • Email system / Emel sistem • SharePoint • EDRMS / Electronic Document and Records Management System • Others. Please specify / Lain-lain. Sila nyatakan. 	<ul style="list-style-type: none"> • Email System: Outlook • DDMS 	
23. Does the department use any cloud services for managing electronic records? <i>Adakah jabatan menggunakan perkhidmatan 'cloud' bagi menguruskan rekod elektronik?</i>	No	
24. What are the knowledge and skills needed in handling and managing the system? <i>Apakah pengetahuan dan kemahiran yang diperlukan bagi mengendalikan dan menguruskan sistem tersebut?</i>	Basic computer skills	
25. What are the specifications of hardware and software used in the system? <i>Apakah spesifikasi perkakasan dan perisian yang digunakan bagi sistem tersebut?</i>	Any computer Any Operating system Flexible	

Arrangement		
7. How are the email records been arranged in the department? <i>Bagaimanakah emel rekod disusun di jabatan?</i>	Alphabetical order <ul style="list-style-type: none"> • Open access • Confidential 	Alphabetical vs Chronological The answer is chronological because it is done by OP1 and OP2.
8. How the email records filing in the department? <i>Bagaimanakah emel rekod difailkan di jabatan?</i>	(dimasukkan) File it manually Classification number given by NAM	
9. Who is responsible in arranging the email records in the department? <i>Siapakah yang bertanggungjawab dalam menyusun emel rekod di jabatan?</i>	Administrative clerk	
Storage		
9. How the email records have been stored in the department? <i>Bagaimanakah emel rekod disimpan di jabatan?</i>	DDMS and filing	
10. Who is responsible in managing and handling the storage? <i>Siapakah yang bertanggungjawab dalam menguruskan dan mengendalikan pusat penyimpanan tersebut?</i>	Clerk	
11. What are the format requirements in storing paper based and electronic records in the department? <i>Apakah keperluan format yang diperlukan bagi menyimpan rekod kertas dan rekod elektronik di jabatan?</i>	Inward and outward correspondences Numbering Reference number	
12. What are the issues in storing the email records? <i>Apakah isu dalam penyimpanan emel rekod?</i>	Didn't upload in DDMS e.g : attachment	
Classification		
7. What is the classification used in managing the email records in the department? <i>Apakah klasifikasi yang digunakan dalam menguruskan emel rekod di jabatan?</i>	Refer clerk	
8. How classification of email records has been conducted in the department? <i>Bagaimanakah klasifikasi emel rekod dilakukan di jabatan?</i>	Print and clerk action to determine the reference number.	
9. Who is responsible in classifying the email records in the department? <i>Siapakah yang bertanggungjawab dalam mengklasifikasikan emel rekod di jabatan?</i>	Officer on each unit	
Access		
3. Who can access to the email records in the department? <i>Siapakah yang boleh mengakses emel rekod di jabatan?</i>	Every personnel can access Who needs the record	
Maintenance		

9. Who is responsible in maintenance of email records in the department? <i>Siapakah yang bertanggungjawab dalam penyelenggaraan emel rekod di jabatan?</i>	Clerk	
10. What are the strategies taken by the department and the ministry in maintaining the digital content? (back-up/recovery, refreshment etc.) <i>Apakah strategi yang dilakukan oleh jabatan ataupun kementerian dalam menyelenggara kandungan digital?</i>	No	
11. What are the issues in maintaining the electronic record keeping system specifically email in the department? <i>Apakah isu dalam menyelenggara sistem penyimpanan rekod elektronik khususnya emel di jabatan?</i>	No	
12. How frequent the maintaining of electronic record keeping system in the department? <i>Berapakah kekerapan proses penyelenggaraan sistem penyimpanan rekod elektronik di jabatan?</i>	No	
Information Management Policies/ Guidelines/Risk		
25. Does the ministry have an Information Management policy? Yes/No 2. Is it available to the public? Yes/No. If yes, can you please provide a copy? <i>Adakah pihak kementerian mempunyai polisi Pengurusan Maklumat? Adakah polisi tersebut boleh didapati untuk tatapan umum? Jika ya, bolehkah saya mendapat salinan polisi tersebut?</i>	No Just follow the ministry policy	
26. Does the ministry have an Information Security policy? Yes/No 4. Is it available to the public? Yes/No. If yes, can you please provide a copy? <i>Adakah pihak kementerian mempunyai polisi Maklumat Keselamatan? Adakah polisi tersebut boleh didapati untuk tatapan umum? Jika ya, bolehkah saya mendapat salinan polisi tersebut?</i>	There is no specific on the department Follow the ministry	
27. Does the ministry have a risk management committee? Yes/No. <i>Adakah pihak kementerian mempunyai Jawatankuasa Pengurusan Risiko? Ya/Tidak</i>	Not for the department But do have for the ministry. There is representative for each department.	
28. Does the ministry have an internal audit committee? 7. If yes, does the committee have a program of work? Who agrees the audit committee's program of work? <i>Adakah pihak kementerian mempunyai jawatankuasa auditor dalaman? Jika ya, adakah jawatankuasa mempunyai program kerja? Siapakah yang bersetuju dengan program kerja jawatankuasa audit?</i>	Managament department	
29. Does the ministry have external auditor? Who are they? <i>Adakah pihak kementerian mempunyai auditor luaran? Siapakah mereka?</i>	Implementation	
30. Who in the ministry acts as internal auditor(s)? What role/position are they? <i>Siapakah di kementerian yang bertindak sebagai auditor dalaman? Apakah peranan dan kedudukan mereka di kementerian?</i>	Management department	

31. Does the ministry have risk register? <i>Adakah kementerian mempunyai pendaftaran risiko?</i>	Yes	
32. Is information on the risk register? <i>Adakah maklumat di daftarkan sebagai risiko?</i>	yes	
33. Who gives advice on record keeping in the ministry? <i>Siapakah yang memberi nasihat dalam pengurusan dan penyimpanan rekod di kementerian?</i>	Administrative section (supposedly)	
34. What types of advice do they give? <i>Apakah jenis-jenis nasihat yang diberi?</i>	Follow the guidelines	
35. What are the policies in managing electronic records specifically email in the ministry? <i>Apakah polisi bagi menguruskan elektronik rekod khususnya emel di kementerian?</i>	No	
36. What are the guidelines in managing electronic records specifically email in the ministry? <i>Apakah garis panduan yang digunakan bagi menguruskan elektronik rekod khususnya emel di kementerian?</i>	No	

Appendix 10: Consent Letter to the Ministry



iSchool
Department of Mathematics & Information Sciences
Faculty of Engineering & Environment
Northumbria University
Pandon Building
Camden Street
Newcastle upon Tyne NE2 1XE
UK

4 April 2016

YB Datuk Seri Dr. Salleh Said Keruak
Menteri Kementerian Komunikasi dan Multimedia Malaysia
Lot 4G9, Persiaran Perdana, Presint 4,
Pusat Pentadbiran Kerajaan Persekutuan,
62100, Putrajaya

The Ministry of Communication and Multimedia Malaysia

My name is Siti Khairunnisa Sheikh Abdul Mutalib and I am a PhD student in the iSchool at Northumbria University, Newcastle on Tyne in the United Kingdom. My PhD research topic is '*Email Record Keeping in The Government Sector: A case study of Malaysia*'. The main objective of this research is to critically explore the management of electronic mail in the context of the transition to digital recordkeeping in the government sector, focusing on Malaysia.

I would like to focus of my research on the Ministry of Communication and Multimedia because the main functions of the ministry are directly related to digital information and communications, and am seeking your agreement to do so. I will use a qualitative research methodology, comprising interviews and observation with selected participants, and critical analysis of existing National Archives of Malaysia, MAMPU and government policy, guidelines and systems for capturing and managing email from a record keeping perspective. During data collection, recording the interviews and capturing images of the email system will be useful to assist in the data analysis process. All data will be held securely and retained in line with Northumbria University's research data retention policy.

Information obtained from this study will benefit the Government of Malaysia's records management policy and record keeping practitioners. The findings may be transferrable to other similar national government contexts.

If you have any questions about my study or your rights, please do not hesitate to contact me directly through email or telephone, or you can contact my supervisors through email Professor Julie Mcleod julie.mcleod@northumbria.ac.uk and Professor Michael Moss michael.moss@northumbria.ac.uk.

By signing this consent form you are authorising the collection of data from staff members in the Ministry for analysis and use in this study. The staff members who provide the data will have consented to participate in the study.

Yours faithfully

Siti Khairunnisa Sheikh Abdul Mutalib
PhD student/researcher
Email: siti.mutalib@northumbria.ac.uk
Mobile: +4407944199174 (UK) / +60196898124 (Malaysia)
cc: Professor Julie Mcleod and Professor Michael Moss



iSchool
Department of Mathematics & Information Sciences
Faculty of Engineering & Environment
Northumbria University
Pandon Building
Camden Street
Newcastle upon Tyne NE2 1XE
UK

4 April 2016

Kementerian Komunikasi dan Multimedia Malaysia

Nama saya Siti Khairunnisa Sheikh Abdul Mutalib dan saya merupakan pelajar PhD di Northumbria University Newcastle of Tyne di United Kingdom. Topik penyelidikan PhD saya adalah 'Email Record keeping in The Government Sector: A case study of Malaysia'. Untuk makluman pihak kementerian, Kementerian Komunikasi dan Multimedia Malaysia telah dipilih sebagai kes penyelidikan ini adalah kerana fungsi utama kementerian yang secara langsung berkaitan dengan topik penyelidikan saya.

Objektif utama penyelidikan ini adalah untuk meneroka secara kritikal pengurusan emel dalam konteks peralihan kepada penyimpanan rekod digital dalam sektor kerajaan, khususnya Malaysia. Penyelidikan secara kualitatif telah dipilih; yang terdiri daripada teknik temu bual, pemerhatian dan analisis secara kritikal dasar-dasar, garis panduan dan sistem yang sedia ada untuk menjejak dan menguruskan emel dari perspektif penyimpanan rekod akan digunakan. Semasa pengumpulan data, rakaman temu bual dan penangkapan imej akan dilakukan bagi membantu proses pengumpulan dan penganalisan data. Maklumat yang diperolehi daripada penyelidikan ini akan memberi manfaat kepada kerajaan Malaysia serta pengamal dasar pengurusan rekod dan penyimpanan rekod. Hasil penyelidikan ini boleh dikaitkan kepada negara lain yang mempunyai konteks pengurusan emel yang sama.

Jika anda mempunyai sebarang soalan mengenai penyelidikan ini atau hak-hak anda, anda boleh menghubungi saya secara langsung melalui emel siti.mutalib@northumbria.ac.uk atau talian bimbit saya +4407944199174 (UK) / 60196898124 (Malaysia). Atau boleh juga menghubungi penyelia saya melalui emel Profesor Julie Mcleod, julie.mcleod@northumbria.ac.uk dan Profesor Michael Moss, michael.moss@northumbria.ac.uk.

Dengan menandatangani borang persetujuan ini, anda akan memberi kuasa untuk semakan rekod, analisis dan penggunaan data yang timbul daripada kajian ini.

Siti Khairunnisa Sheikh Abdul Mutalib
PhD student/researcher
Email: siti.mutalib@northumbria.ac.uk
Mobile: +4407944199174 (UK) / +60196898124 (Malaysia)

cc: Professor Julie Mcleod and Professor Michael Moss

Appendix 11: Example of Consent Letter to One of Policy Maker



iSchool
Department of Mathematics & Information Sciences
Faculty of Engineering & Environment
Northumbria University
Pandon Building
Camden Street
Newcastle upon Tyne NE2 1XE
UK

4 April 2016

Tuan Azemi bin Abdul Aziz
Ketua Pengarah Arkib Negara Malaysia
Jalan Tuanku Abdul Halim, Kompleks Kerajaan,
50480 Kuala Lumpur,
Wilayah Persekutuan Kuala Lumpur

National Archives of Malaysia

My name is Siti Khairunnisa Sheikh Abdul Mutalib and I am a PhD student in the iSchool at Northumbria University, Newcastle on Tyne in the United Kingdom. My PhD research topic is '*Email Record Keeping in The Government Sector: A case study of Malaysia*'. The main objective of this research is to critically explore the management of electronic mail in the context of the transition to digital recordkeeping in the government sector, focusing on Malaysia.

I would like to focus of my research on the Ministry of Communication and Multimedia because the main functions of the ministry are directly related to digital information and communications, and am seeking your agreement to do so. I will use a qualitative research methodology, comprising interviews and observation with selected participants, and critical analysis of existing National Archives of Malaysia, MAMPU and government policy, guidelines and systems for capturing and managing email from a record keeping perspective. During data collection, recording the interviews and capturing images of the email system will be useful to assist in the data analysis process. All data will be held securely and retained in line with Northumbria University's research data retention policy.

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Yours faithfully

Siti Khairunnisa Sheikh Abdul Mutalib
PhD student/researcher
Email: siti.mutalib@northumbria.ac.uk
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cc: Professor Julie Mcleod and Professor Michael Moss



iSchool
Department of Mathematics & Information Sciences
Faculty of Engineering & Environment
Northumbria University
Pandon Building
Camden Street
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UK
4 April 2016

Tuan Azemi bin Abdul Aziz
Ketua Pengarah Arkib Negara Malaysia
Jalan Tuanku Abdul Halim, Kompleks Kerajaan,
50480 Kuala Lumpur,
Wilayah Persekutuan Kuala Lumpur

Arkib Negara Malaysia

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Objektif utama penyelidikan ini adalah untuk meneroka secara kritikal pengurusan emel dalam konteks peralihan kepada penyimpanan rekod digital dalam sektor kerajaan, khususnya Malaysia. Penyelidikan secara kualitatif telah dipilih; yang terdiri daripada teknik temu bual, pemerhatian dan analisis secara kritikal dasar-dasar, garis panduan dan sistem yang sedia ada untuk menjejak dan menguruskan emel dari perspektif penyimpanan rekod akan digunakan. Semasa pengumpulan data, rakaman temu bual dan penangkapan imej akan dilakukan bagi membantu proses pengumpulan dan penganalisan data.

Maklumat yang diperolehi daripada penyelidikan ini akan memberi manfaat kepada kerajaan Malaysia serta pengamal dasar pengurusan rekod dan penyimpanan rekod. Hasil penyelidikan ini boleh dikaitkan kepada negara lain yang mempunyai konteks pengurusan emel yang sama.

Jika anda mempunyai sebarang soalan mengenai penyelidikan ini atau hak-hak anda, anda boleh menghubungi saya secara langsung melalui emel siti.mutalib@northumbria.ac.uk atau talian bimbit saya +4407944199174 (UK) / 60196898124 (Malaysia). Atau boleh juga menghubungi penyelia saya melalui emel Profesor Julie Mcleod, julie.mcleod@northumbria.ac.uk dan Profesor Michael Moss, michael.moss@northumbria.ac.uk.

Dengan menandatangani borang persetujuan ini, anda akan memberi kuasa untuk semakan rekod, analisis dan penggunaan data yang timbul daripada kajian ini.

Siti Khairunnisa Sheikh Abdul Mutalib
PhD student/researcher
Email: siti.mutalib@northumbria.ac.uk
Mobile: +4407944199174 (UK) / +60196898124 (Malaysia)

cc: Professor Julie Mcleod and Professor Michael Moss

Appendix 12: Example of Research Participant Consent Form



Faculty of Engineering and Environment

RESEARCH PARTICIPANT CONSENT FORM

Name of participant	
Researcher's name	Siti Khairunnisa Sheikh Abdul Mutalib
Title of research project	Email Recordkeeping in the Government Sector: Case study of Malaysia

Brief description of nature of research and involvement of participant:

This aims to critically explore the management of email in the context of the transition to digital recordkeeping in the government sector, focusing on Malaysia. The research objectives are:

1. To explore the legal and regulatory environment in relation to the Government of Malaysia and the information it creates and holds.
2. To critically review existing policy, guidelines and systems for capturing and managing email in the Government of Malaysia from a record keeping perspective, comparing them with the national benchmarking countries.
3. To investigate the current practices of managing electronic mail in the Government of Malaysia in comparison with its existing policy and guidelines.
4. To explore the evolution of recordkeeping email in the Government of Malaysia.

The case study of Malaysia will focus on Ministry of Communication and Multimedia. The participants represent senior management and operational staffs are needed. The output of the study will benefit the Government of Malaysia, records management and record keeping policy and practitioners and could be transferrable to other similar national government contexts.

Information and activities required:

The selected participants, who have indicated their willingness to participate, will be contacted. Questions will be asked through email and in depth questions will be asked during face to face interviews and be recorded. The data will be used as a descriptive analysis and for the case study. Participants will be anonymised but the name of the organisation will be revealed, as contextual information is required to make sense of the research. The participants will be provided with a draft of the text to edit and confirm. No commercially sensitive material will be gathered.

Standard statement of participant' consent (please tick as appropriate)

I confirm that:	
I have been briefed about this research project and its purpose and agree to participate	<input type="checkbox"/>
I have discussed any requirement for anonymity or confidentiality with the researcher"	<input type="checkbox"/>
I agree to be audio recorded	<input type="checkbox"/>
I understand I can withdraw at any time in the process	<input type="checkbox"/>

****Specific requirements for anonymity, confidentiality, data storage, retention and destruction**

How the information will be stored and published:

The interview/email data will be kept secure on password-protected campus networked drives at Northumbria University; consent forms and the personal contact information provided by the participants will also be kept secure and confidential on the servers. Data will be anonymised as described above. Interview data captured on recording devices will be transferred to the secure servers after the interview and then wiped from the recording device. Personal details will be deleted at end of study. All other research data will be kept until the end of the study, and will then be disposed of in line with Northumbria University's retention policy.

Signed

Date

Standard statement by researcher

I have provided information about the research to the research participant and believe that he/she understands what is involved.

Researcher's signature

Date

Siti Khairunnisa Sheikh Abdul Mutalib
PhD researcher

iSchool, Department Mathematics & Information Sciences, Pandon Building, Camden Street,
Northumbria University, Newcastle upon Tyne, NE2 1XE, United Kingdom.

Tel: +4407944199174 Email: siti.mutalib@northumbria.ac.uk

Appendix 13: Example of Ministry Consent Form



RESEARCH ORGANISATION CONSENT FORM

Name of participant	
Researcher's name	Siti Khairunnisa Sheikh Abdul Mutalib
Title of research project	Email Recordkeeping in the Government Sector: Case study of Malaysia

Brief description of nature of research and involvement of organisation:

This aims to critically explore the management of email in the context of the transition to digital recordkeeping in the government sector, focusing on Malaysia. The research objectives are:

1. To explore the legal and regulatory environment in relation to the Government of Malaysia and the information it creates and holds.
2. To critically review existing policy, guidelines and systems for capturing and managing email in the Government of Malaysia from a record keeping perspective, comparing them with the national benchmarking countries.
3. To investigate the current practices of managing electronic mail in the Government of Malaysia in comparison with its existing policy and guidelines.
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Standard statement of organization consent (please tick as appropriate)

I confirm that:	
I have been briefed about this research project and its purpose and agree to participate	<input type="checkbox"/>
I have discussed any requirement for anonymity or confidentiality with the researcher"	<input type="checkbox"/>
I agree to be audio recorded	<input type="checkbox"/>
I understand I can withdraw at any time in the process	<input type="checkbox"/>

****Specific requirements for anonymity, confidentiality, data storage, retention and destruction**

How the information will be stored and published:

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Signed

Date

Standard statement by researcher

I have provided information about the research to the research participant and believe that the organisation understands what is involved.

Researcher's signature

Date

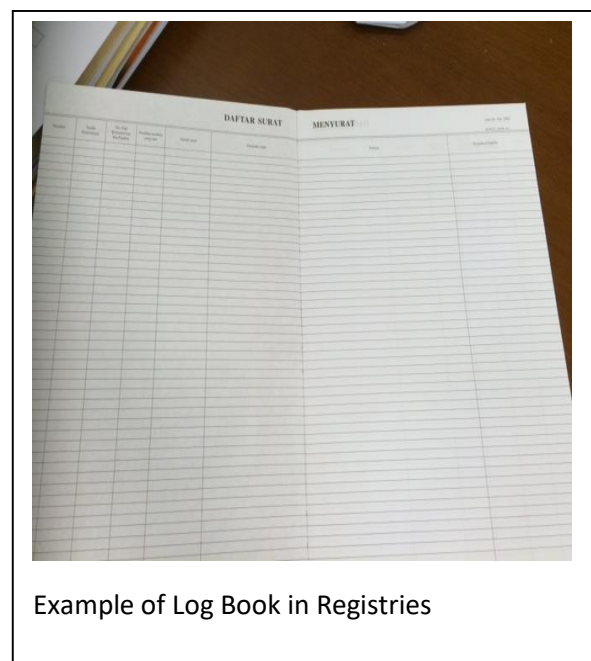
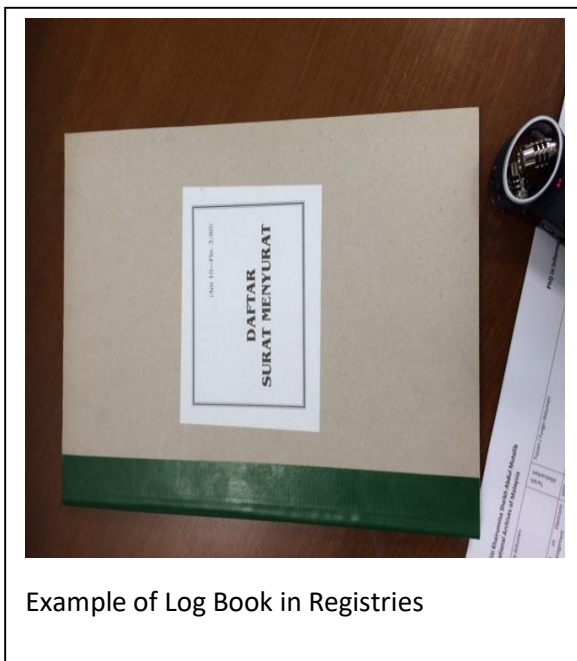
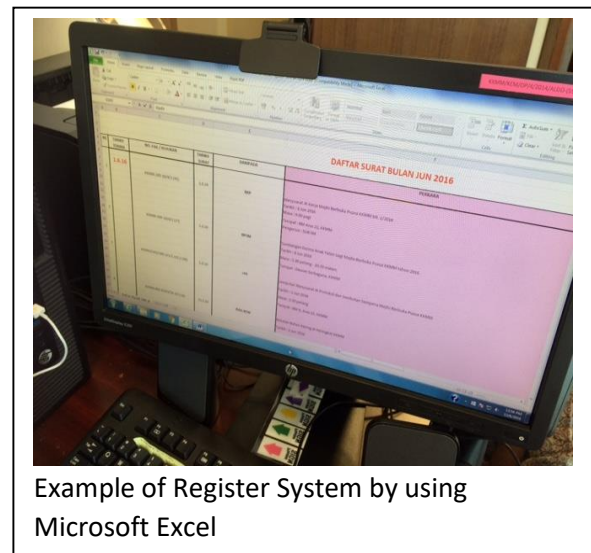
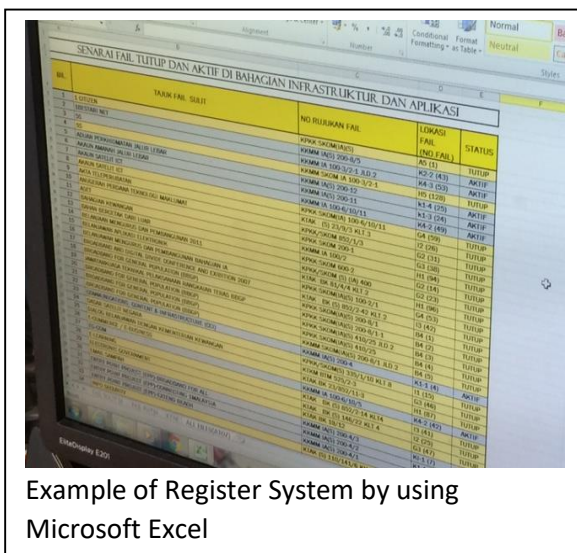
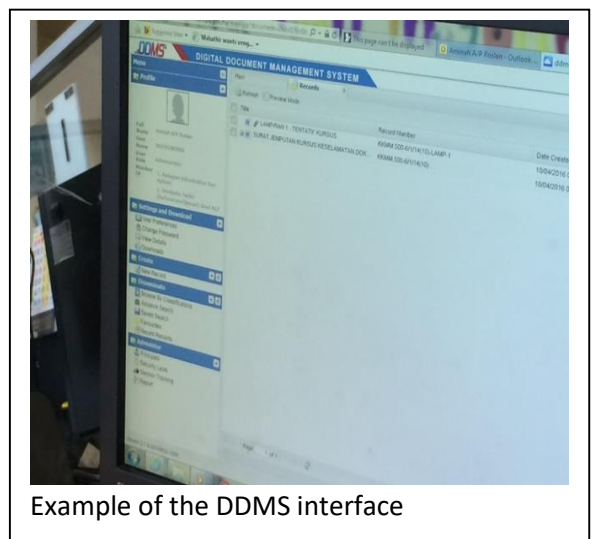
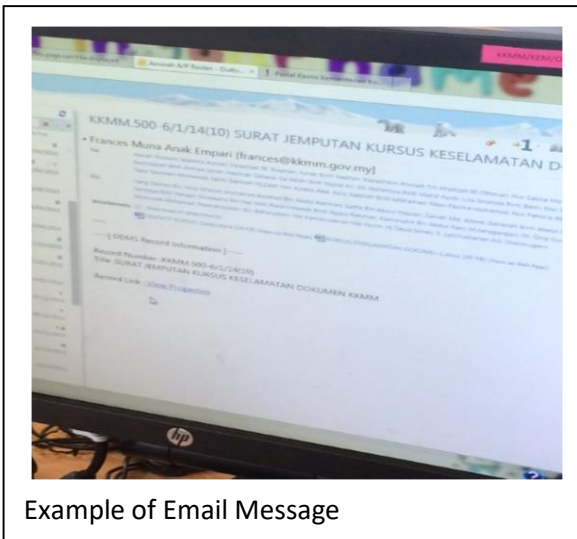
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Appendix 14: Photographs during Observations



Appendix 15: Example of Interview Transcript

Begin of 1st session

MAMPU: Supaya sistem kita teratur dan cepat. Dari segi manual nak cari maklumat tu susah sikit lah. Bukan susah tetapi dia makan masa.

SK: Kalau sebelum ni memang manual ya puan?

MAMPU: Memang. Filing system yang warna warni tu kan. That's why timbul kehilangan rekod, institusi negara semua hilang. Actually kita ada slide. Nanti saya bagi je dekat you.

SK: Terima kasih.

MAMPU: Ada detail semua dia tak ingat. Record keeping government sector. Case study in Malaysia. Maknanya whatever email yang kita dapat tu, official email, sepatutnya record ni memang kita capture dalam system. Otherwise dia macam tulah, terkeluar. Habislah. Benda ni kena ada SOP.

SK: Puan, saya nak tanya pendapat puan. Ada segelintir kakitangan kerajaan ni adalah golongan yang senior. Jadinya maksudnya kadang-kadang tu mereka ada pemikiran yang bahawa email ini tidak boleh diterima sebagai..

MAMPU: Official?

SK: Ya, official. Jadi apa pendapat puan?

MAMPU: Yelah, dulu memang ada practice kalau email ni macam sebelum MAMPU pun kita dah maklumkan yang official tu diconsidered yelah kadang2 dorang nak paper juga kan.

SK: Yelah betul.

MAMPU: Itu memang sampai sekarang pun macam tu. You email..

SK: Print

MAMPU: Lepas tu disusuli dengan surat official. Masih ada lagi lah tapi slowly I think with this project. Sebab dia tiada . untuk simpan information. Nak print dorang malas lah kan. Print nak masuk dalam file, satu hal. Kalau capture immediately , I think slowly dorang dah boleh terimalah. And then we also think, MAMPU ada keluarkan, kalau email official dia apa dia, macam mana.

SK: Ya, ada. Yang saya baca MAMPU ada keluarkan format penulisan email untuk sector kerajaan.

MAMPU: Ya. Apa yang perlu. Title order, metadata

SK: Ya

MAMPU: Yang dalam documentation kita metadata kan. Dia punya orang yang create email, semua tu kena capturekan, orang yang hantar email and then kalau recipient dia ramai kita dah ada procedure first person yang dapat apa nama tu kena copy.

SK: Dia kena copy. Ya.

MAMPU: Dia kena copy. All this thing, kita ambil Semua through email saja. Tapi memang, kadang-kadang kita pun kena keluar surat juga. Hah itu kita ada dalam sistem punya itu scan surat yang kita terima banyak ke. Tapi in future I think we are going to change lah and with the new generation, diaorang lebih suka nak cepat.

SK: Lepas tu saya difahamkan, ANM dalam proses untuk bangunkan satu garis panduan tentang penggunaan WhatsApp sebagai records. So, kalau dari segi MAMPU sendiri macam mana puan?

MAMPU: WhatsApp itu belum, dalam perbincangan lah tu. Nanti bila arkib akan ada kerjasama. This while kita buat kerjasama dengan arkib negara. Sebab dia orang subject matter expert. They know ni the apa yang perlu. And we DDMS ni comply to ISO16175. Standards kan.

SK: Ya

MAMPU: Itu you dapat information dalam tu pun boleh. Dalam maklumat tu.

SK: Maksudnya dari segi security puan, dari segi sekuriti DDMS ni, macam pengawalan sekuriti dia macam mana puan? Sebab yang saya difahamkan server dia di bawah MAMPU.

MAMPU: Central

SK: Dia centralised di bawah MAMPU. Jadi dari segi sekuriti untuk..

MAMPU: Access?

SK: Ya.

MAMPU: Kalau dari segi fizikal memanglah kita masuk dalam data centre itself memang susah nak masuk macam tu sahaja lah. Dia kena isi borang-borang yang sepatutnya dapat permission nak masuk. And then kalau vendor, kena ada orang government yang iringi lah siapa. Those yang semualah bukan sistem ini, semua sistem tu vendor-vendor yang terlibat tu kena isi borang..

SK: Borang keselamatan?

MAMPU: Borang keselamatan. Borang.. (she's calling her colleague and invited her to join the discussion). Hah tu lah, dari segi sekuriti, memang impact tu dari segi fizikal. Dalam sistem dalam ISO.. all tu kena ada lah. Protocol semua kena jaga dari segi.

SK: Maksudnya dia ada kaitan dari segi , DDMS tu ada kaitan dengan sekuriti ISO16175.

MAMPU: Dia kena comply baru boleh considered as records management. Sekarang ni pun tengah. You tahu tak kita ada DDMS 1.0 .

SK: Dan akan keluar Version 2.0. Dari segi perbezaan dia. Apa perbezaan drastik dia puan? Sebab saya rasa 1.0 ni pun baru 2015 ataupun akhir 2014 ya?

MAMPU: Sebab dia ada features dia yang tulah dokumen terperingkat.

SK: Ohh sebelum ni umum sahaja terbuka.

MAMPU: Terbuka sahaja. Lepas tu kita kena berurusan dengan sijil ISO pula, dulu dengan arkib sahaja kan. Tak go into detail document terperingkat. So, ni kita go into detail lah. And then apa-apa yang

tu. Satu lagi ada features why you develop the system kan. Mula-mula kita tak nampak ada benda-benda yang kita belum masuk kan lah. Tambahan itu yang kita ambil kesempatan projek 2.0 pula. Hasnah ada dia boleh ni. (one of her colleague will explain). Yang ni minta maaf lah.

SK: Tak apa puan. Kalau dari segi dokumen, contohnya adakah fail atau rekod ketika pembangunan DDMS, contohnya macam sistem, kertas kerja, cadangan atau keperluan fungsi dan spesifikasi sistem dan lain-lain. Kalau ada boleh tak saya nak lihat, kalau tak confidential untuk yang ni saya lihatlah dari segi dia punya contohnya macam draf, kertas cadangan ke apa ke. Macam tulah dia punya antara-antara.

MAMPU: You boleh masuk tengoklah, sebab ni terbuka kan. Sebab saya nak contohnya dalam sistem lah kan.

SK: Tetapi DDMS tu saya tak boleh access kan puan? Sebab saya tiada account kan.

MAMPU: Yelah, saya tunjuk kan lah nanti. (she's calling her colleague for discussion)

End of 1st session.

Begin of 2nd session

MAMPU: Research ni sebenarnya dia punya apa tu research ni specific to email record keeping in the government sector: case study of Malaysia jadi relate dengan DDMS ni kita kata kalau email standard email, kita ada projek tu kan? 1GovUC. Kiranya semua sector government ni guna 1GovUC email. Lupa pula email kita. Yang dia punya concern ni email record keeping ni melalui DDMS, email kita capture through the system. Kita ada dia punya cara capture email option.

MAMPU: Sebab email tu, once officer dah keluar, dia dah gone. So, bila dia dah tied dengan DDMS tu, dia akan simpan dalam DDMS tu. Sebab user to tak di delete dalam DDMS. So, kita akan carry dia punya cerita-cerita dalam system tu. So, tak hilang lah cerita-cerita dia. Email memang delete. Bila kita keluar daripada MAMPU, delete.

SK: Kalau email dekat MAMPU ni, seorang staff tu dia keluar atau retired, dia ada macam schedule ke berapa lama untuk boleh di delete. Sebab macam saya dulu, saya bekerja, saya handle bahagian email. Rekod-rekod email dekat ExxonMobil, macam kami, kami ada retention. Sorang staff ni, bila dia dah keluar dalam masa 6-12 bulan baru kami boleh delete dia punya email account tu.

MAMPU: Lama sangat. Kita tiada. Rasanya kita sebulan je kan. Kita kena ambil kira kadar ditangguhkan. Kalau ditangguhkan, kita extent sebab pegawai semua, hantar tu semua dah kena delete lah.

MAMPU: Saya rasa kurang daripada 3 bulan kot. Tapi kena confirm kan.

MAMPU: Jabatan saya dulu buat sebulan.

MAMPU: Sebab bila dia dah delete daripada ni, dia tiada dapat seen anything lah kan.

MAMPU: one of the respondents, telling about the situation where she was sending an email to the person who is no longer working there.

MAMPU: Macam DDMS ni pun, kita ada ID juga, dan kita immediately kalau dia pindah, human resource kena maklumkan CC kita yang perlu di delete daripada system DDMS.

MAMPU: Soft delete lah. Soft delete nama ada tapi dalam system ada lagi. As history. History tu penting kan.

MAMPU: Remove dia daripada agency tu lah. Sebab kita nak mengelakkan bayaran kan. Stop dia punya. You tahu kan ada bayaran.

MAMPU: Semuanya ada bayaran. Mana ada free. Saya nampak sebab you relate dengan record keeping.

SK: Kalau dari segi perubahan sebelum dan selepas pelaksanaan DDMS tu macam mana?

MAMPU: Sebagai experience kita sebagai pengguna lah kan, bila benda tu dah dalam 1 tempat kan, nak capai sekejap je. Kalau sebelum ni kan, bersepah, nak minta tolong kena cari, kena isi borang siapa yang nak pinjam fail kena rekod kan. Semua recorded. Electronically tapi recorded lah. Ada audit trail. So kita boleh lihat lah siapa access, siapa yang tengok fail tu dan sebagainya.

SK: So, kiranya sebelum DDMS ni memang fully manual?

MAMPU: Manual.

MAMPU: GOE tu?

MAMPU: GOE pun tak.

MAMPU: GOE ni tak ikut standard yang arkib tu ISO16175. Generic Office Electronic. Tetapi bila dia buat ujian dengan arkib dia tidak menepati ISO comply. So that's why kita develop DDMS ni. Tak standard, Sebab ISO 16175 ni kita follow international standard. So, kira standard 1 dunia lah kan. Mudah lah nanti kalau apa-apa kita rujuk dan sebagainya. Kalau sebelum ni tiada standard, tiada apa-apa. Caca marba. Sekarang ni kerajaan nak keluarkan satu sistem, international standard yang sama. Apa tu, semua boleh pakai yang sama.

SK: Kalau yang sebelum ni, GOE ni siapa yang developed?

MAMPU: GOE siapa ya? MAMPU juga. Lama dah GOE TU. Tahun 2005. Dia bukan back base, dia macam alone, kena install. Ada system yang remain tapi tiada maintenance. Just gunapakai sahaja lah. Ini pun kita buy license juga kan. Mahal juga sebenarnya. Lepas tu, kita developed DDMS 1.0 tu pun, beli license juga. Sekarang, kerajaan buat inisiatif langkah penjimatan so kita akan developed 2.0 so to make sure, penggunaan yang apa? Penjimatan, kepakaran dalaman. Sebab sebelum ni DDMS, kita tak own system. Sekarang ni, 2.0 kita akan fully own lah.

SK: Sebelum ni vendor ya puan? Kalau yang 1.0 tu agensi luar ke apa?

MAMPU: apa konsep, pay per user per use. Software as a service (Saas).

SK: So, sekarang ni kalau version 2.0 ni, memang fully ni lah?

MAMPU: Nak kata fully developed inside pun tak juga. Sebab kita ambil, ada juga vendor customize shelf punya product. So, kita ambil product tu, customize mengikut kehendak pengguna, kerajaan. Ajar kita punya team dalaman, untuk belajar buat customization ni. So, nanti apa-apa kita buat sendiri lah. Kalau kita nak tambah agensi ke, tambah user ke kita akan buat sendiri.

MAMPU: The first person, yang recipient kalau ramai, the first person tu kena capture.

MAMPU: So, nanti dia akan bawa kepada penambahbaikan atau cadangan ke apa?

SK: Sebab, bila saya pergi ke kementerian, mereka minta theses ini untuk penambahbaikan pengurusan email rekod dekat sector kerajaan.

MAMPU: Agensi tu, agensi yang tidak melaksanakan DDMS?

SK: Melaksanakan DDMS.

MAMPU: Tak, maksud saya agensi kata nak menambah baik.

SK: Tak, maksudnya dari segi improvement untuk government sector lah. Mungkin, tak menyentuh pada DDMS tapi dari segi cara-cara (practices).

MAMPU: Best practices.

SK: Kadang-kadang ada certain ini mereka implement DDMS tapi tak semua staff dalam and then practices dia pun tak sama.

MAMPU: Actually, kita punya aim tu semua pakai. Tapi dari segi duit nya lah kan. Sebab dia email pun kita tak bagi semua orang kan, sebab dia ada reputasi cost disitu.

SK: Sebab tu tadi saya tanya puan tu, masih ada lagi kakitangan yang mereka rasa email tu tak boleh diterima sebagai official record. Jadi mereka avoid untuk guna DDMS. Walaupun DDMS tu dah ada.

MAMPU: Ada tak, surat arahan atau email yang menggantikan surat rasmi kerajaan. Bukan tiada atau masih tak diterima lagi.

MAMPU: Garis panduan daripada MAMPU tu ada, you kena capture semua. Even dekat MAMPU pun kita diberi standard semua kan. Tapi, I'm not sure dekat sector awam ni dah dimaklumkan.

MAMPU: Cuma saya masa dulu dekat IDC (International Data Corporation) kan email tu sendiri, masa insert email tu dia dah bubuh no fail tau. Memang official lah. Sebab macam saya dekat IDC dulu masa tu Tan Sri Sidek KSN (Head of Secretary Malaysia). So kita orang dekat agensi, kita punya Tan Sri Ghani tu kan, memang tak bagi guna surat sahaja kalau dalaman.

MAMPU: It is actually depends on the top management. Kalau dia nampak punya kepentingan tu, macam orang ni memang lah Tan Sri Ghani Phatail ni orang law ni memang suka IT kan. Satu dia kata, everything is bahan bukti.

MAMPU: Kita nak salah print pun takut sebab dia dah keluarkan nak print nya kena double sided lah. Macam kena follow betul2 pengurusan rekod lah kan.

MAMPU: Baguslah sebab kepentingan tu, email jadi macam bahan.

MAMPU: Top management lah sebenarnya , kalau top management kata macam ni, semua orang lah ...

MAMPU: Sekarang kita email tu, kita just capture , sebab dah ada dalam DDMS tu. Kita capture dah dapat no. bilangan tu cepat lah kan.

SK: Tapi puan macam ada beberapa agensi kerajaan mereka menggunakan hybrid sistem. Dimana mereka ada DDMS dan setiap email yang di capture tu di print out.

MAMPU: Sekarang nipun kita dalam proses, dalam hybrid juga sebab towards paperless ni memang it takes some time kan. Memang tu, sebab itulah bahan bukti tu dekat ni, dorang ni nak juga fizikal. Kalau pergi ke mahkamah dorang nak fail fizikal. So yang DDMS ni, kita guna hybrid. Satu print masuk dalam registry, tapi sehelai sahaja lah. Tiada lah banyak dulu kan semua kena isi. Semua orang kena isi kan. Cetak kan.

MAMPU: Sekarang tiada.

MAMPU: Tujuan nya ialah sebagai arkib, untuk sebagai bahan bukti mahkamah. Kalau akta or whatever tukar nanti, immediately kita boleh keluarkan elektronik kan.

MAMPU: Ada ke negara lain yang fully.

SK: Setakat ni, saya rasa antara yang lead dalam segi email records ni adalah US. USA. Even, dekat United Kingdom pun mereka tiada print out email, mereka dalam sistem tapi yang dari segi yang kuat untuk sebagai yang menerima email sebagai evidence adalah America lah setakat ni. Itu based on literature.

MAMPU: Tulah dari segi akta-akta perundangan kena tukar lah kan.

MAMPU: Kekuatan masih tak berapa . Orang-orang dia semua okay, cuma akta dia tak berapa

MAMPU: Kita nak ukur daripada apa, tiada bahan bukti. Hilang lagi. Pulau Batu Puih.

MAMPU: Yang penting banyak berjimat lah kalau DDMS ini. Satu paperless tu kan, bayangkanlah kalau sehelai kita ada sejuta penjawat awam. Bayangkan lah kalau satu hari kan? Lpeas tu kalau kita buat fail-fail kita kena simpan tu berapa tahun? 10 tahun ke?

MAMPU: 7 tahun.

MAMPU: 7 tahun kan sebelum dilupuskan. Sampai ada yang kena sewa ruang lah. Dan banyak kos tau.

MAMPU: Sampai tinggi saya pergi melawat. Yang dia orang nak mencari. Nak mencari satu hal kan. Kasihan tapi benda tu kena nilah. Sekarang ni, dulu dia simpan sampai 20, 21 tahun. So, sekarang arkib kata 7. Yang lain tu you pergi hantar arkib lupus.

MAMPU: Diaorang duduk simpan still dapat nasihat arkib negara lah sebab dia pakar bidang kan. Everything dia akan advice. Even dalam sistem kita pun, kita buat macam tu lah. Jadual pelupusan rekod. Immediately, bila create patutnya dia link dengan berapa. Create harini, 7 tahun lupus. Then, semuanya kena melalui arkib kan. Dalam sistem ni akan, minta permohonan pun dalam sistem.

Appendix 16: Example of Open Coding

Create	Notes
<p>1. What records are created or produced in the department? <i>Apakah rekod yang dicipta atau dihasilkan di jabatan?</i></p>	<p>First-SK: Assalamualaikum wbt, terima kasih diucapkan kepada Puan Alni dan ENCIK Zaim kerana sudi membantu saya dalam menjawab dan menyempurnakan PhD saya. Kalau Puan dan encik tak keberatan boleh tak ceritakan latar belakang pengalaman bekerja.</p> <p>Pengalaman bekerja saya di sektor kerajaan lah kan sejak 2007 dikementerian sumber manusia dan kemudian saya ditukarkan ke, jabatan penerangan, jadi saya di kementerian komunikasi ni baru saja bertukar lah dalam amsa 2 minggu macam tu. Memang terus terang saya katakana experience saya lebih kepada manual. Rekod manual, diceritakan tentang tempat lama tu mungkin lebih banyak share lah kan tapi kat sini baru 2 minggu. Saya sendiri belum lagi didedahkan sepenuhnya sistem repository banyak digunakan disini. Penerangan dulu dia baru nak macam baru nak dibangunkan sebenarnya. Macam disini banyak MAMPU kan daripada MAMPU. Tapi macam tempat saya lama, sebab tengok juga lah keperluan jabatan penerangan ni macam lain sikit. Banyak menggunakan storage apa semua lah jadi memang kena sebuat manul dan data2 di jabatan penerangan tinggi high risk tak boleh dikongsi dengan kat luar.</p> <p>Rekod yang dicipta ni, rekod tu apa2 sahaja lah kan. Biasa nya diciptakan, kita akan create apa2 rekod kemudian kita akan disimpan di dalam DDMS. Atau Digital Document Management System. Sebenarnya, apa yang saya nak disini, dia sebab email dan sistem dia sendiri diuruskan dibawah MAMPU. Jadi, kebanyakannya kami disini sebagai pengguna. End user sahaja. Contohnya, email itu sendiri dia sebahagian daripada rekod, direkodkan disimpan dalam DDMS jadi dia macam email tu sendiri memang diuruskan oleh MAMPU, kami ni menjaga dan memonito dan pengguna2 di kementerian ini sahaja.</p>

Commented [U1]: Email as a record

	SK: Kalau macam rekod tadi kan puan, selain daripada email apa lagi rekod yang dihasilkan di bahagian puan, BPM? Mungkin dari segi surat ke memo ke? Rekod tu banyak surat, memo lepas tu kontrak, nota2 perbincangan memang direkodkan, email keluar dan masuk.	
2. How email record is created in the department? Bagaimanakah emel rekod dicipta di jabatan?	Biasanya email rekod kita create bila ada arahan. Biasanya dari arahan, ataupun initiative user itu sendiri, ataupun dalam erti kata lain, bila ada keperluan. Contohnya, email sendiri macam saya perlu berkomunikasi dengan pembekal ke apa memang perlukan email lah, sebab itu sebagai email rasmi. Apa2 contohnya, maksudnya kalau ada apa2 permasalahan kita boleh sebagai bukti evidence memang rasmi.	<p>Commented [U2]: Create: Instruction from top officer</p> <p>Commented [U3]: Create: Own initiative</p> <p>Commented [U4]: Create: Communication</p> <p>Commented [U5]: Email: as evidence</p>
3. Why emails are being created in the department instead of letter? Mengapakah jabatan menggunakan emel selain surat?	Selain daripadanya ianya cepat, ianya juga salah satu medium rasmi juga. Selain daripada tu sebenarnya, matlamat kerajaan contohnya MAMPU sendiri nak kurangkan penggunaan kertas. Paperless kepada ICT yang lebih hijau.menyokong.	<p>Commented [U6]: Email: Efficient</p>
Capture		
1. How the email records been captured in the department? Bagaimanakah emel rekod digunapakai atau ditawan di jabatan?	Email rekod kita banyak pakai yang aplikasi yang disediakan untuk DDMS tu. Ditawan tu maksudnya penggunaan kan? SK:Maksudnya,dimasukkan.macam email tu diterima macam nak memastikan email tu boleh diguna sebagai rekod dan dimasukkan sebagai yang saya faham kerajaan menggunakan DDMS, jadi bagaimana proses penawanan atau pengguna pakai email tu? Daripada email dai punya flow. Dia kebanyakan, surat2 yang kita pakai macam memo selalu pengguna dia akan scan dia akan masuk kan ke dalam email.so, daripada email tu, dia masukkan ke dalam DDMS. Setiap memo, surat kita akan kita buat softcopy dalam DDMS tu.	
2. How the department capture the paper based and electronic format of record?	SK:Maksudnya, mereka yang bertanggungjawab menghasilkan kena ni.. Sama macam salinan fizikal tu, pergi pada fail softcopy dia kan lepastu upload pada system DDMS. Lepas tu, mana-mana kertas float sama juga kan, kita terima kita scan fizikal tu kita akan rekodkan juga.	

<p>Bagaimanakah rekod-rekod jenis kertas dan elektronik digunakan atau ditawan di jabatan?</p>	<p>SK: Sama juga, maksudnya print file.</p>	
<p>3. How to identify the email records as evidence in business process? Bagaimanakah emel rekod dikenalpasti sebagai bahan bukti didalam proses transaksi di jabatan?</p>	<p>Biasanya contohnya macam email tu sendiri, kita boleh catat semua user memalu audit, log tu sendiri kita boleh check delivery keapa, macam contoh email tu sendiri ada function delivery report. Dia akan hanatr report kepada kita.</p> <p>SK: Kalau macam saya nak tentukan email tu, sebagai bahan bukti.ada tak macam kita tengok based on letterhead dia, siapayang menghantar atau amcam tu?</p> <p>Yang tu macam ni, apa yang biasa kita email. dah jadi macam budaya. Dalam government sendiri kita nak benda tahu benda tu sahik kita kena guna email rasmi kita. Kita tak boleh guna email yahoo ke gmail. Kalau itu memang urusan rasmi. Contohnya macam kementerian dia ada kod2 dia. Maksudnya berurusan dengan email itulah.</p> <p>SK: Tapi kalau puan, email tu menggunakan email account rasmi tapi, contents dia tu bukan rekod. So, maksudnya bukan sesuatu yang kita boleh terima sebagai rekod lah. So kalau yang tu macam mana. So, kalau macma puan dah terima email tu, macam mana puan pastikan yang email tu boleh dijadikan sebagai bahan bukti?</p> <p>Dia kalau ikutkan, dari garis panduan daripada MAMPU, kita dah kelaskan yang email ni digunakan ssebagai medium rasmi dan apa2 dan kalau saya tak silap mamou ada keluarkan link tatacara penggunaan email, memang semua penjawat awam harus tahu. Dia ada pekeliling Kemajuan Pentadbiran Awam, Bilangan 1/ 2003. Garis panduan tentang tatacara penggunaan email dan elektronik sektor kerajaan.</p> <p>SK: Ini saya boleh access dekat laman web MAMPU.</p>	<p>Commented [U7]: Email: audit trail</p> <p>Commented [U8]: Compliance: Guideline from MAMPU</p> <p>Commented [U9]: Compliance: Circular letter</p>

Record Keeping System	
1. What kind of recordkeeping systems does the department use? Apakah jenis sistem penyimpanan rekod yang digunakan di jabatan?	Jenis sistem penyimpanan ni memang kita guna DDMS dengan fizikal. SK: Ynag fizikal tu tadi,registry tu ke? Ya, bilik fail. SK: Yang electronic tu? Electronic itulah kita pakai SPD dan DDMS.
2. Which of the following recordkeeping systems does the department use? Antara berikut yang manakah jenis pengurusan dan penyimpanan rekod sistem yang digunakan di jabatan? <ul style="list-style-type: none"> • Paper registry system / Manual registri sistem • Electronic registry system / Elektronik registri sistem • EDRMS / Electronic Document and Records Management System • Others. Please specify / Lain-lain. Sila nyatakan. 	Manual registry system, yang ni ada. Elektronik registry system yang ni ada Sistem Pengurusan Dokumentasi. DDMS. SK: Kalau yang lain. Mungkin ada yang lain2 ke? Setakat ini, tu jelas.
3. Who is responsible in handling and managing the system? Siapakah yang bertanggungjawab dalam mengendalikan dan menguruskan sistem tersebut?	Pegawai fail dengan DDMS tu MAMPU. Sk: Kalau dikementerian, wakil daripada? Puan Muna, dia Pegawai Rekod.
4. How email records are managed in the department? Bagaimanakah emel rekod diuruskan di jabatan ini?	Boleh terangkan? Uruskan amcam mana? SK: Maksudnya mungkin email ni dah diterima lepas tu individu sendiri yang kena macam cik cakap kena masukkan dalam DDMS, siapa yang menerima atau creator tu, ianya macma disusun. Mungkin ada garis panduan, macam email ni perlu disusun atau rekod yang kita dapat tu perlu disusun dalam satu folder ke, ikut alphabetical ke, fail2 ke.
5. Which of the following systems are used to manage emails in the department?	Sama macam tadi, kita ikut tatacara daripada arkib. Email system memang ada. Share point tiada. Ni ada.

Registry		
1. Is there a registry system for paper records in the department? Adakah jabatan mempunyai sistem registri bagi rekod kertas?	Memang ada	
2. Is there a registry system for electronic records in the department? Adakah jabatan mempunyai sistem registri bagi rekod elektronik?	Ada juga. DDMS tadi.	
3. What are the metadata (data represent) used in the registry system? Apakah metadata yang digunakan di registri sistem?	<p>SK:Maksudnya macam nombor rujukan ke, tajuk ke, tarikh.</p> <p>Kebanyakan nombor fail.</p> <p>SK:Kalau nombor fail tu siapa yang uruskan? Pgawai bilik fail yang bertanggungjawab. Saya tingkat bawah, memang ada pegawai fail tetapi dia ikutlah siapa yang dilantik ikut pada orang yang dilantik. Setiap bahagian ada dan semua tatacara pengurusan penamaan ke apa2 pun, memang kita ikut daripada create sampailah ke pelupusan pun kita ikut arkib Negara punya tatacara guideliens. Macma nak nombor tahun kan, ada dia punya nombor rujukan tu ikutlah daripada ANM.</p>	<p>Commented [U14]: Compliance: paper records comply with NAM Guideline</p>
4. What is the classification scheme used in organizing the records in registry? Apakah skema klasifikasi yang digunakan dalam menyusun rekod-rekod di registri?	<p>SK:mungkin rekod2 ni disusun mengikut huruf, ABCDE, ataupun tarikh mengikut chronology maksudnya mana rekod yang paling terkini dapat dia disusun di atas ataupun dia mengikut klasifikasi fail yang macam arkib 100, 200. Ada pengkelasan dia.</p> <p>Dia ada pengkelasan kan? Lepas tu dia penyusunan dalam fizikal tu sendiri ikut tarikh lah, sia masuk dulu tarikh masuk dulu dengan KF.</p> <p>SK:Kiranya firstly dia akan susun mengikut klasifikasi fail, 100, 200. Lepas tu, dalam fail tu disusun mengikut yang terkini.</p>	

<p>Antara sistem berikut yang manakah yang digunakan bagi menguruskan emel di jabatan?</p> <ul style="list-style-type: none"> Email system / Emel sistem SharePoint EDRMS / Electronic Document and Records Management System Others. Please specify / Lain-lain. Sila nyatakan. 	<p>SK: Yang atdi email system tu Outlook ke puan? Ya, Outlook.</p> <p>SK: Yang 1govuc tu, email account ya? Ya, dia 1govuc tu sistem bersepadu. 1 Government unified communication. Maksudnya semua, komunikasi bersepadu termasuk email, semua directory, pengurusan.</p> <p>SK: So, antaranya ialah email account lah. Perkhidmatn eh, 1govuc tu. Dia lead by MAMPU. Tapi salah sat utu email lah.</p>	
<p>6. Does the department use any cloud services for managing electronic records? Adakah jabatan menggunakan perkhidmatan 'cloud' bagi menguruskan rekod elektronik?</p>	<p>Ada.</p> <p>Untuk soalan 5 tadi, others tu kita boleh tambah identity rebrushining and management services.</p> <p>SK: yang ni apa ya? Ni sebab soalan tadi kata, menguruskan email, account user</p> <p>SK: Yang ni siapa yang uruskan? MAMPU juga daripada pentadbir UC, dari setiap pentabdir Unified communication.</p> <p>SK: Yang ni memang BPM sahaja ke yang guna? Semua. Tapi, admin kita lah.</p> <p>SK: OH sebab ni first time saya dengar, bila saya pergi bahagian lain tak pernah sebut. Oh, kiranya BPM yang handle ni lah.</p>	
Arrangement		
<p>1. How is the email records been arranged in the department? Bagaimanakah emel rekod disusun di jabatan?</p>	<p>Sama macam soalan tadi, dia disusun .</p> <p>SK: maksudnya disusun ikut tarikh ke.</p> <p>Dia ikut perkara dengan tarikh.</p>	

	<p>SK:So ni methods dia sama juga, kena print and file.yang ni kalau email rekod.</p> <p>Email rekod, biasanya tiadalah setiap email tu kita nak jadikan rekod kan. Maksudnya yang perkara penting sahaja lah,kita print kan, kita akan simpan dalam DDMS dan satu lagi fail fizikal.</p>
2. How the email records filing in the department? Bagaimanakah emel rekod difailkan di jabatan?	Mengikut perkara email dengan pengkelasan . kadang ada pengkelasan, kita selitkan email tu sekali.
3. Who is responsible in arranging the email records in the department? Siapakah yang bertanggungjawab dalam menyusun emel rekod di jabatan?	<p>Pemilik account dan pegawai fail tadi.</p> <p>SK:Maksudnya pegawai file tu yang bilik registry ataupun Puan Muna? Pegawai Bilik. Kak Diana,dia yang pengkelasan, sistem SPD pun dia yang jaga.</p>
Storage	
1. How the email records have been stored in the department? Bagaimanakah emel rekod disimpan di jabatan?	<p>SK:Maksudnya ada satu server ke, storage ke.</p> <p>Dia cloud storage kat MAMPU dan bilik rekod fail untuk salinan fizikal.</p>
2. Who is responsible in managing and handling the storage? Siapakah yang bertanggungjawab dalam menguruskan dan mengendalikan pusat penyimpanan tersebut?	<p>Pegawai Bilik fail, Puan Diana.selalu kalau apa2 memo kita akan bagi pada dia, so dia, akan uruskan buat pengkelasan apa semua. Kita maklumkan perkara ni,</p> <p>SK:So, maksudnya yang boleh masuk bilik tu, Puan Diana sorang ke ataupun?</p> <p>Dia. Sebab bilik sulit ada fail terperingkat.</p>
3. What are the format requirements in storing paper based and electronic records in the department? Apakah keperluan format yang diperlukan bagi menyimpan rekod kertas dan rekod elektronik di jabatan?	<p>SK: Contohnya macam rekod kertas tu, yang diperlukan ialah fail, mungkin ada kertas keluar masuk fail.</p> <p>Itu ada. Format kertas keluar masuk tu memang ada.kadang2 ada lah memo ke, maklumat sikit.</p>

Commented [U15]: Capture: as evidence

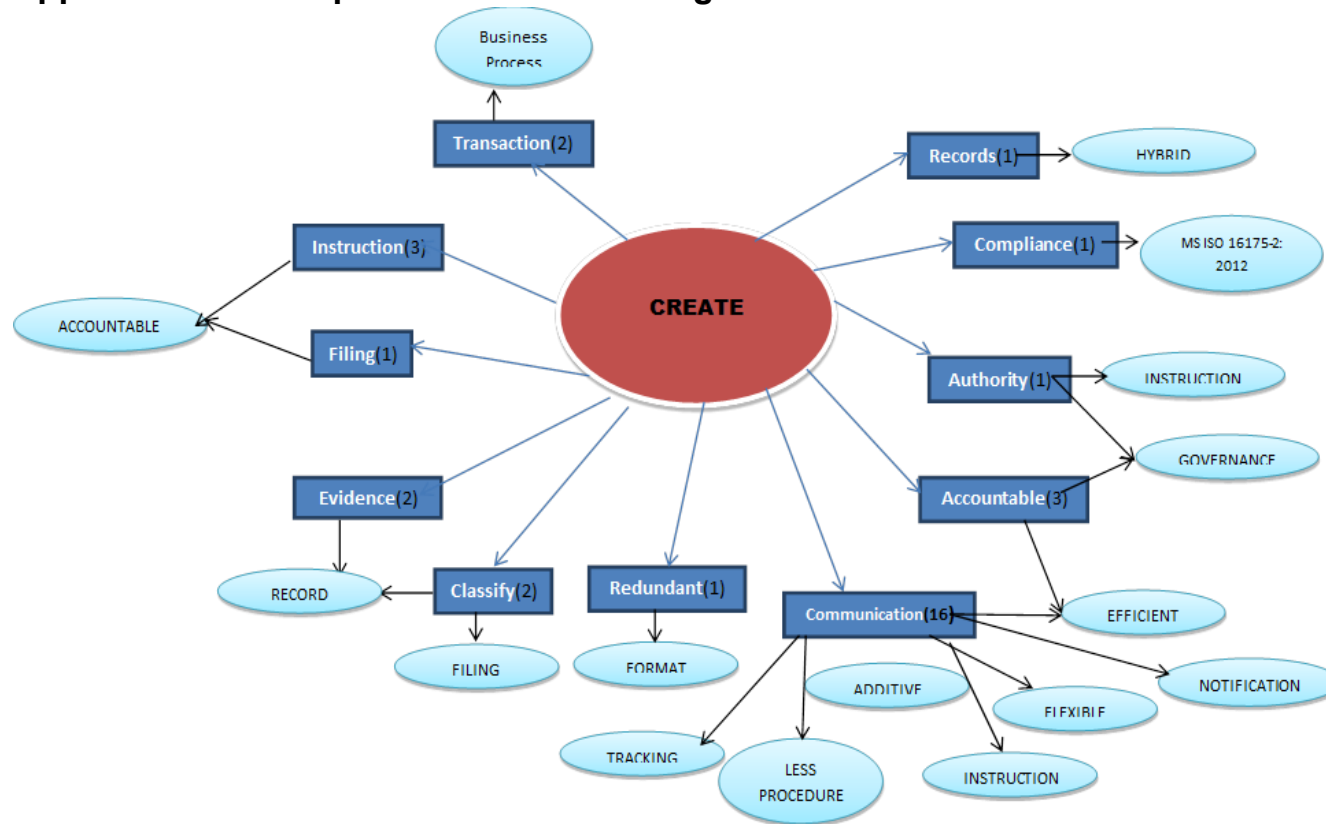
	<p>SK:kalau dari segi elektronik? Mungkin ada spesifikasi computer yang tertentu ke?</p> <p>Semua boleh,(27.20) semua format pdf apa semua tu eh?</p> <p>SK: Atauapun requirement operating system?</p> <p>Dia ada minimum requirement ke. Window XP ke atas, dengan internet.</p> <p>SK: browser? Ada specific browser?</p> <p>Browser semua okay. Semua compatible.kalau tiada outlook pun, kita masih boleh guna email kan?</p>	
Classification		
<p>1. What is the classification used in managing the email records in the department?</p> <p>Apakah klasifikasi yang digunakan dalam menguruskan emel rekod di jabatan?</p>	<p>Sama juga kita memang follow record awam dengan tatacara tulah.</p> <p>SK: Yang 200 tu ke?</p> <p>Ya.</p>	
<p>2. How classification of email records has been conducted in the department?</p> <p>Bagaimanakah klasifikasi emel rekod dilakukan di jabatan?</p>	<p>Berdasarkan perkara.</p> <p>SK:Maksudnya macam bila dah dapat ni, tadi kan encik Zaim kata, hantar pada puan Diana, dia yang klasifikasikan ke?</p> <p>Ya, dia yang klasifikasikan , dia dah tahu dah fail mana yang untuk perkara. Selalu dia akan tengokberdasarkan perkara lah. So, dia dah tahu. Sebab setiap klasifikasi tu dia dah ada perkara besar. Lepas tu ada bawah2 dia.</p>	
Access		
<p>1. Who can access to the email records in the department?</p> <p>Siapakah yang boleh mengakses emel rekod di jabatan?</p>	<p>Pemilik akaun tu sendiri dengan pemilik akaun DDMS.</p> <p>SK: Pemilik akaun DDMS maksudnya?</p> <p>Dia setiap pengguna email, akan ada akaun DDMS.</p> <p>SK: Kiranya, setiap yang mengeluarkan email ini, ada 2 akaun. Satu akaun email dan satu lagi DDMS.</p> <p>Tapi yang banyak guna pegawai yang beratnggungjawab lah bahagian tu sebab budaya.</p> <p>SK: Kalau kat sini siapa?</p>	

	<p>Puan Diana. macam user pun boleh access sistem tu, tengok fail kandungan folder kalau sistem tu lah.</p> <p>SK: macam saya, bukan fail saya tapi saya boleh tengok juga? Tak boleh semua.</p> <p>SK: oh tak boleh juga.</p> <p>Dia dah ada strict.</p> <p>SK: oh macam DDMS tu, rekod lain tu tak boleh eh/ saya hanya boleh tengok apa yang saya hasilkan sahaja?</p> <p>Yang kalau kita sharing boleh. dengan colleague lain boleh.</p>	Commented [U16]: Access: Accountability
Maintenance		
<p>1. Who is responsible in maintenance of email records in the department? Siapakah yang bertanggungjawab dalam penyelenggaraan emel rekod di jabatan?</p>	<p>Pegawai Rekod Jabatan atau pembantu pegawai rekod jabatan.</p> <p>SK: Pegawai rekod Jabatan adalah?</p> <p>Puan Muna. Ataupun bahagian, bahagian sistem SPD, pegawai aplikasi. cawangan aplikasi, sebab buant penyelenggaraan sistem sendiri.</p> <p>Sk: OH, kalau macam dari segi the whole ni Puan Muna?</p> <p>Satu kementerian ni Puan Muna.</p> <p>SK: kalau BPM ni, pegawai aplikasi.</p> <p>Sebab, sebelum DDMS, kita pakai SPD, lepas tu dia dating DDMS. Tapi kita masih pakai SPD.</p> <p>SK: SPD masih dikekalkan lah eh, tapi hanya di BPM sahaja.</p> <p>Dia in house development.</p> <p>Saya rasa ini sahaja temuramah dengan Puan Aini. Terima kasih banyak2.</p>	

Appendix 17: Example of Axial Coding (Transferred from Comment tool in Microsoft Word to Microsoft Excel)

Coding	Sub- coding	Sub-sub coding	Question	No	Roles	Department	Citation
Electronic Records	Storage	Decentralised	RKS	2	OP1D3	D3	"We save the file in our thumb drive, hard disc, external hard disc."
Electronic Records	Data sharing	Business Process	RKS	6	OP2D3	D3	"We use sharing folder but not that often."
Record Keeping system	Reflective	Conventional	RKS	1	OP2D1	D1	"The contents for both files need to be completed and reflect each other so the physical file can be used a security copy to continue the task if DDMS can't be used."
Record Keeping system	Access	Security	Access	1	OP1D1	D1	"Not all records we can access in DDMS. Only that we are allowed."
Record Keeping system	Access	Security	Access	1	OP2D1	D1	"If not confidential. If open access and have account, user may view the record."
Record Keeping system	Ineffectiveness	Conventional	RKS	5	OP1D2	D2	"It is better to send hardcopy as well even the officer use DDMS."
Record Keeping system	Access	Unconditional	Access	1	OP2D2	D2	"Every employees can accesst to the file."
Record Keeping system	Storage	Open Access	Tracking	2	OP2D2	D2	"DDMS is to keep open access records."
Record Keeping system	Usage	Storage	Capture	1	OP1D3	D3	"DDMS is used to store the records. Everyone can access it."
Record Keeping system	Storage	Effective	Storage	1	OP1D3	D3	"There is a system used to store the records in DDMS. Since our email storage size is small. That records will remain in the system."
Capture	Filing	Accountable	Arrangement	2	OP1D2	D2	"Employee needs to file the email received. "
Capture	Accountable	Instruction	Capture	1	OP2D2	D2	"Email will be filed according to top officer's order."
Capture	Evidence	Authority	Capture	3	OP2D2	D2	"Top officer will identify which email can be accepted as evidence."
Capture	Management	Accountable	Capture	1	OP1D2	D2	"Normally, as Personal Assistant, I will print and attach for my boss."
Capture	Practice	Conventional	Capture	1	OP1D2	D2	"Every email needs to be printed.before showing to the boss"
Capture	Accountable		Capture	2	OP2D3	D3	"The individual itself will take action for the email records. Administration unit only monitor the flow."
Capture	Accountable	Filing	RKS	4	OP2D3	D3	"The officer needs to print and send to a clerk for filing process."
Capture	Evidence	Authority	Capture	5	OP1D3	D3	" We practice any email received need to CC to our top officer as a proof. Then we will discuss what action need to be taken based on the email. "
Capture	Compliance	Authority	Capture	1	OP2D3	D3	"The top officer will determine which records need to be captured."
Capture	Compliance	Authority	Capture	2	OP2D3	D3	"As for email we will CC to administartion unit in the department so they will notify inward and outward email."
Create	Instruction	Authority	Create	2	OP1D1	D1	"Normally, email will be created when there is a command from the top management. Normally, from command, or user own initiative, or in other words when there is a necessary. "

Appendix 18: Example of Selective Coding “Create” Theme



Coding	Total
Create	33
Record Keeping system	25
Compliance	22
Capture	20
Change Management	19
Tracking	14
Classification	11
Email	9
Organize	5
Records Management	4
Electronic Records	3
Decentralised	3
Registry	3
Governance	3
Risk assessment	1
Electronic Records Management	1
Personal	1
Delete	1
Filing	1
Record Keeping	1

Appendix 19: Example of Comparison of Data in Department 1

Create	PIC1D1	OP1D1	OP1D2
13. What records are created or produced in the ministry?	<ul style="list-style-type: none"> • Refer to the catalogue in DDMS • Memo • Minute meeting 	<ul style="list-style-type: none"> • Email • Memo • Letter • Contract • Discussion notes 	<ul style="list-style-type: none"> • Slide • Act • Audio • Minute meeting • Meeting feedback • Email • The ministers paper • Policy • Circular letter • Newspaper cutting
14. Who is responsible in creating the email records in the ministry?	Every officer		
15. How email record is created in the ministry?	Command from the top management Communication method	<ul style="list-style-type: none"> • Based on command from the top officer • As for communication medium • Own initiative when needed 	<ul style="list-style-type: none"> • Based on command from the top officer • Own initiative when needed
16. Why emails are being created in the ministry instead of letter?	<ul style="list-style-type: none"> • Can be access through mobile • More efficient • Accepted as a record 	<ul style="list-style-type: none"> • Efficient • Formal communication • Paperless government 	<ul style="list-style-type: none"> • Efficient • Effective • Economy • Safe (direct to the recipient) • One of the government communication medium
• HOD Documentation			
13. How is the compliance and ethics function structured and integrated into the ministry?	The command started from implementation of DDMS guidelines. Records Management Unit will assign a letter to the ministry to use the guideline and monitor the implementation.		

14. Is the ministry compliance program effective? <i>Adakah program pematuhan kementerian berkesan?</i>	Refer to Records Management Unit		
15. How often does the ministry conduct a risk assessment for significant threats?	MAMPU prepared the risk assessment and once a year (during October) will be the risk assessment process by MAMPU to the ministry. Person involves: <ul style="list-style-type: none"> • ICT and security unit • Operation Data unit 		
16. How can the ministry's compliance policies be improved and better applied?	<ul style="list-style-type: none"> • Awareness: Competency and provide more training to the employees • Monitoring process 		
Capture			
19. How the email records been captured in the department?	DDMS	<ul style="list-style-type: none"> • Email records: DDMS • Memo letter : scan -> email -> DDMS 	DDMS
20. How the department capture the paper based and electronic format of record?	Hybrid system: paper and electronic Paper: print and file Email : DDMS	Print-File-DDMS	Electronic: DDMS Paper based: Registry The original signature
21. How the connections between email records creation and capture are establish in the department?	Outlook + DDMS =Adinns system which to integrate between both Outlook and DDMS		
22. How to identify the email records as evidence in business process in the department?	<ul style="list-style-type: none"> • Formatting • Letterhead • Email reference number • Sender: Valid account domain • Transaction log 	Delivery Report Email account sender Following guidelines given by MAMPU & NAM. Circular Letter: No 1/2003	DDMS: Audit trail Email: transactional log (Date, sender, recipient)

	<ul style="list-style-type: none"> By using DDMS: Validity who capture the email. 		
23. Why email records are identified as evidence in the department?	Because email has been accepted as records in the public sector.	Based on circular	Formal email As a public record in daily formal task
24. Who is responsible in capturing the email records in the department?	Internal: Sender External: Screening for security From the guideline: recipient or 1 st recipient need to capture the email record.	The owner of the account / recipient	<ul style="list-style-type: none"> Every recipient need to capture by themselves Sender
Tracking			
7. What is record tracking?	Easy to retrieve the records whenever needed	User can trace records based on file reference number as for the movement of file.	A system to identify the location of the file, who access the file and how many times the file has been referred.
8. Is there any record tracking in the department? Why record tracking is perform in the department?	DDMS (by searching the keywords e.g, title)	Yes, to trace the movement of file.	Yes, The file movement, registration loaning file (log book), sending letter book, inward outward correspondences record system, attachment registration.
Registry			
40. Is there a registry system for paper records in the department?	Yes	Yes	Yes
41. Is there a registry system for electronic records in the department?	Yes (DDMS)	Yes (DDMS)	Yes

42. What is the history and background of registry system in the department?	Previously was decentralized, starting 2015 change to centralized registry.		
43. What are the procedures involved in the registry process? How the procedures are taken?	Refer Record Officer Previous file has be sent to registry		
44. How the registry system reflects on the transition process from paper based to electronic records in the department?	For reference use and hybrid system.		
45. How the register list looks alike and how it assists in the audit trail in the department?	Refer Records Management Unit		
46. What are the metadata (data represent) used in the registry system?	Refer Records Management Unit	File Number	Descriptive metadata
47. Is there a file plan for paper records in the department?	Adapt The Document Management Guidelines which provided by Records Management Unit.		
48. Is there a file plan for electronic records in the department?	DDMS procedure from MAMPU and NAM.		
49. How does the file plan relate to the registry system?	Refer Records Management Unit		

50. If the registry has been abandoned when did this happen and what replaced it?	N/A		
51. Why the registry has been abandoned? (rely on answer from Q10)	N/A		
52. What is the classification scheme used in organizing the records in registry?	Refer Records Management Unit	<ul style="list-style-type: none"> • Classification File • Chronological order 	Classification File Function & Activity
Record Keeping System			
26. What kind of recordkeeping systems does the department use?	DDMS (official) Own initiative (unofficial)	<ul style="list-style-type: none"> • Physical: File room • Electronic: Document Management System (only at this division) • DDMS 	Hybrid system
27. Which of the following recordkeeping systems does the department use? <ul style="list-style-type: none"> • Paper registry system / • Electronic registry system • EDRMS / Electronic Document and Records Management System • Others. Please specify 	<ul style="list-style-type: none"> • Paper registry system • Electronic registry system • Others: Document Management System (Only this division) 	<ul style="list-style-type: none"> • Paper registry system • Electronic registry system • Others: Document Management System (Only this division) 	<ul style="list-style-type: none"> • Paper registry system • Electronic registry system • DDMS
28. What is the name of record keeping systems used in the department?	DDMS		

29. Who is responsible in handling and managing the system?	Records Management Unit	DDMS: Record Officer	Record Officer Department
30. How email records are managed in the department?	Captured in DDMS and following the Retention Schedule provided by NAM.	Based on the guideline from NAM.	Electronic follow MAMPU guidelines Conventional follow NAM guidelines
31. Which of the following systems are used to manage emails in the department? <ul style="list-style-type: none"> Email system SharePoint EDRMS / Electronic Document and Records Management System Others. Please specify / 	<ul style="list-style-type: none"> Email system: Outlook DDMS Others: Identity Provisioning & Management Services 	<ul style="list-style-type: none"> Email system: Outlook DDMS Others: Identity Provisioning & Management Services 	<ul style="list-style-type: none"> Email System Others: Registry system
32. Does the department use any cloud services for managing electronic records?	Email and DDMS is using cloud, server is provided by MAMPU.	Yes, 1GOVUC.	Yes.
33. What are the knowledge and skills needed in handling and managing the system?	Know how to use DDMS application Basic skills IT, web browser.		
34. What are the specifications of hardware and software used in the system?	<ul style="list-style-type: none"> OS: Window XP (minimum requirement) Browser: Google Chrome Internet access 		
Arrangement			

10. How is the email records been arranged in the department?	Refer Record Officer	<ul style="list-style-type: none"> • Subject • Date 	<ul style="list-style-type: none"> • Function • Activity
11. How the email records filing in the department?	Print-File-Registry	Print –File (According to Classification File given by NAM monitored by Record Officer)	Captured using DDMS Print and file at the registry
12. Who is responsible in arranging the email records in the department?	<ul style="list-style-type: none"> • Records Management Department • User decide which file to use. 	<ul style="list-style-type: none"> • The account owner • File Officer at the unit. 	Owner or user of the email account
Storage			
13. How the email records have been stored in the department?	Cloud storage: can use own computer	Cloud storage managed by MAMPU Physical: File room	Using DDMS and physical copy at registry
14. Who is responsible in managing and handling the storage?	Registry: Records Management Unit Electronic: MAMPU	The Officer of the File Room.	DDMS: maintained by MAMPU Conventional by Record Officer
15. What are the format requirements in storing paper based and electronic records in the department?	Computer desktop Internet Access Web browser Registry: Scanner DDMS : backup TIFF/PDF	<ul style="list-style-type: none"> • File • Inward and Outward log book • Window XP and above • Internet access 	Paper records: Shelves, pocket file, file box Electronic: scanner, computer, laptop, internet.
16. What are the issues in storing the email records?	If DDMS having technical problem Backup: Registry (paper based file)		
Classification			
10. What is the classification used in managing the email records in the department?	Refer Records Management Unit	The guidelines for Managing Public Record	Following the Classification File by NAM

11. How classification of email records has been conducted in the department?	Refer Records Management Unit	Print and File according to the Subject and File Number	Function and activity
12. Who is responsible in classifying the email records in the department?	Creator of the email		
Access			
4. Who can access to the email records in the department?	Every owner of email account can access to their own email records DDMS: Open access	The owner of the email account The owner of DDMS account The Officer in charge of File Room	DDMS user
Maintenance			
13. Who is responsible in maintenance of email records in the department?	Record Officer	<ul style="list-style-type: none"> Record Officer Application Officer (Only for this division) 	Record Officer
14. What are the strategies taken by the department and the ministry in maintaining the digital content? (back-up/recovery, refreshment etc.)	Internal storage as a backup storage which can be use externally through online.		
15. What are the issues in maintaining the electronic record keeping system specifically email in the department?	Email captured in DDMS. If there is a technical problem for DDMS, the DDMS can't be accessed. Dependant on DDMS.		

16. How frequent the maintaining of electronic record keeping system in the department?	Refer MAMPU		
Information Management Policies/ Guidelines/Risk			
37. Does the ministry have an Information Management policy? Yes/No 2. Is it available to the public? Yes/No. If yes, can you please provide a copy?	Specifically, No. However, there is a policy which focusing on ICT Security which handle by Information Management Division (this division)		
38. Does the ministry have an Information Security policy? Yes/No 4. Is it available to the public? Yes/No. If yes, can you please provide a copy?	Refer above.		
39. Does the ministry have a risk management committee? Yes/No.	Yes, Service Continuity Plan Committee		
40. Does the ministry have an internal audit committee? 7. If yes, does the committee have a program of work? Who agrees the audit committee's program of work?	Yes, officer from National Audit Department Ministry Audit Committee		
41. Does the ministry have external auditor? Who are they?	Yes, officer from National Audit Department (different from internal auditor) which report directly to Head Auditor of Malaysia		

42. Who in the ministry acts as internal auditor(s)? What role/position are they?	There is internal auditor unit at the ministry. Other than that, there is an asset unit which the committee is the representative from each unit and department.		
43. Does the ministry have risk register?	Yes		
44. Is information on the risk register?	Yes. Data Recovery handled by Information Management Unit.		
45. Who gives advice on record keeping in the ministry?	National Archives of Malaysia specifically the Record Officer.		
46. What types of advice do they give?	Records management , classification		
47. What are the policies in managing electronic records specifically email in the ministry?	More into guidelines and circular letter instead of policy.		
48. What are the guidelines in managing electronic records specifically email in the ministry?	The Guidelines of Managing Public Records DDMS Guidelines		

Appendix 20: Example of Comparison of Data between PICs

Questions	PIC1D1	PIC1D2	PIC1D3	Notes
Create				
1. What records are created or produced in the ministry?	<ul style="list-style-type: none"> • Refer to the catalogue in DDMS • Memo • Minute meeting 	<ul style="list-style-type: none"> • Written(Paper) • Electronic • WhatsApp 	<ul style="list-style-type: none"> • Formal (minute meeting internal & external) • Informal (current command) 	The types of records is only different by the terms they used, however it is similar format and types which can be categorized into two; paper and electronic records.
2. Who is responsible in creating the email records in the ministry?	Every officer	<ul style="list-style-type: none"> • Officer • Clerk (not giving an implication) 	Each officer (grade 41, 44 and 48)	The records is only can be created by the officer in the ministry.
3. How email record is created in the ministry?	Command from the top management Communication method	<ul style="list-style-type: none"> • Inward • Outward (Both print and file) <p>The records here is following hierarchy from top to bottom management</p>	<ul style="list-style-type: none"> • Following ISO standard • Government record procedure (filing system from NAM, email from MAMPU) 	
4. Why emails are being created in the ministry instead of letter?	<ul style="list-style-type: none"> • Can be access through mobile • More efficient • Accepted as a record 	<ul style="list-style-type: none"> • Efficient • Fast • Immediate respond 	<ul style="list-style-type: none"> • Efficient • Saving time • Hybrid :email & letter 	

HOD Documentation				
1. How is the compliance and ethics function structured and integrated into the ministry?	The command started from implementation of DDMS guidelines. Records Management Unit will assign a letter to the ministry to use the guideline and monitor the implementation.	None	Following guidelines given from MAMPU & JPICT (a committee lead by MAMPU and Head of Secretary Malaysia and ministry representative) * this department they monitor inward and outward email correspondences to ensure no misused	
2. Is the ministry compliance program effective?	Refer to Records Management Unit	None	• He said I need to refer to Information Management Department (IMD) This department don't have capacity to answer this question	
3. How often does the ministry conduct a risk assessment for significant threats?	MAMPU prepared the risk assessment and once a year (during October) will be the risk assessment process by MAMPU to the ministry. Person involves: • ICT and security unit • Operation Data unit	Never at this specific department	*refer IMD This department don't have capacity to answer this question	

4. How can the ministry's compliance policies be improved and better applied?	<ul style="list-style-type: none"> • Awareness: Competency and provide more training to the employees • Monitoring process 	File the documents that have in DDMS (The current practice at the ministry is print out the document (1st page) and file in a registry).	<ul style="list-style-type: none"> • Expand ISO standard 	The answers given from the participants are based on their task and responsibilities.
Capture				
1. How the email records been captured in the department?	DDMS	<ul style="list-style-type: none"> • Received email: evaluate and determine if the email needs to be captured or not. • The evaluation process it depends on the contents and the designation or authority of the sender 	<ul style="list-style-type: none"> • No digital methods • Print and file 	The Policy Department is the department where some of the staff still is not fully utilize the DDMS Application. According to the PIC Policy, the department is at the stage of implementing DDMS.
2. How the department capture the paper based and electronic format of record?	Hybrid system: paper and electronic Paper: print and file Email : DDMS	It depends on consideration or judgement Chief Clerk : captured as proof or references	Electronic :capture in individual 1GovUC account sync with individual Outlook If formal record, they will print and file DDMS Paper record: By individual The numbers of paper records are higher than electronic records • I can say that, the process of capturing electronic record is	The answer from PIC Operation : She is the decider of which records to be captured and kept at her unit, but the activity of capturing is done by the clerk or her assistant. The answer from PIC Policy seems like he knows the procedure to capture the electronic records in DDMS, however the implementation still not fully implemented

			more into individual initiative	based on the answer Q1 (Capture).
3. How the connections between email records creation and capture are establish in the department?	Outlook + DDMS =Adinns system which to integrate between both Outlook and DDMS	Print and file	MAMPU and IMD roles and responsibilities. The interviewee said DDMS is the answer for this question	
4. How to identify the email records as evidence in business process in the department?	<ul style="list-style-type: none"> • Formatting • Letterhead • Email reference number • Sender: Valid account domain • Transaction log • By using DDMS: Validity who capture the email. 	DDMS can't be identified but if email has been printed and file in a physical file, it can be as evidence.	<ul style="list-style-type: none"> • Approval by Head of Department • Each email need to have CC to head of department of higher priority people to identify email as a record 	The answers from three departments are difference. The issues are the implementation of DDMS and trustworthy of DDMS application.
5. Why email records are identified as evidence in the department?	Because email has been accepted as records in the public sector.	As one of formal document	Following MAMPU policy and guidelines Head of Secretary ministry used email as an evidence	All agree with email is accepted as evidence and records at the ministry.
6. Who is responsible in capturing the email records in the department?	Internal: Sender External: Screening for security From the guideline: recipient or 1st recipient need to	Each individual	Secretary Department	The practices of capturing email are difference. PIC Operation mentioned each individual is reponsible to capture their own email, however she assigned her

	capture the email record.			assistant to capture on behalf of her.
Tracking				
1. What is record tracking?	Easy to retrieve the records whenever needed	System record file. The function is to search for the record	History of particular event for references A proper record file	
2. Is there any record tracking in the department? Why record tracking is perform in the department?	DDMS (by searching the keywords e.g, title)	Yes. For references	Yes. For future reference They are using centralize filing system	
Registry				
1. Is there a registry system for paper records in the department?	Yes	Yes.	Yes. Following NAM	
2. Is there a registry system for electronic records in the department?	Yes (DDMS)	Not sure.	Yes. Following NAM	
3. What is the history and background of registry system in the department?	Previously was decentralized, starting 2015 change to centralized registry.	Centralize. However, the interviewee suggest to have a decentralize registry at each department or section.	Following NAM This department don't have their own registry. The registry is under ministry.	Based on observation after the interview done, each of department have their own file room to store confidential records and files. So, they have a decentralized registry for confidential records and files.

4. What are the procedures involved in the registry process? How the procedures are taken?	Refer Record Officer Previous file has be sent to registry	Received letter Numbering the letter Filing Clerk open DDMS and refer the suitable reference number Make a copy Original send to receiver and copy keep in a file	High level document: following ISO standard The procedure: i. Record received ii. record number iii. record the document Person involves: i. Desk officer Grade 41 ii. chief clerk iii. Clerk	Based on three departments, the Policy Department is the department which have high level documents or secret and top secret records.
5. How the registry system reflects on the transition process from paper based to electronic records in the department?	For reference use and hybrid system.	Paperless Centralize The negative effects: • Cannot trace the paper records. (The interviewee referring to DDMS)	Refer Records management team	PIC Operation has a doubt on DDMS. However, based on the asnwrs from the interview session, the thought of preferring paper based records can be identified.
6. How the register list looks alike and how it assists in the audit trail in the department?	Refer Records Management Unit	The interviewee said the list is at the clerk. (From observation, she doesn't familiar with the list)	Log book in and out file Log book in and out record Standard system file	
7. What are the metadata (data represent) used in the registry system?	Refer Records Management Unit	• Reference Number • Date • Letterhead	• Date • Title • Unique Number	The same metadata , it just different term. For example: the term reference number and unique number is the same meaning.

8. Is there a file plan for paper records in the department?	Adapt The Document Management Guidelines which provided by Records Management Unit.	No	Refer to Management Department	They are unfamiliar with file plan.
9. Is there a file plan for electronic records in the department?	DDMS procedure from MAMPU and NAM.	No	Refer to Management Department	They are unfamiliar with file plan.
10. How does the file plan relate to the registry system?	Refer Records Management Unit	N/A	Retrieving record	They are unfamiliar with file plan.
11. If the registry has been abandoned when did this happen and what replaced it?	N/A	There is a registry; however, the classification is too general. The reference number will be created if the record is actively used.	N/A	
12. Why the registry has been abandoned? (rely on answer from Q10)	N/A	N/A	N/A	

13. What is the classification scheme used in organizing the records in registry?	Refer Records Management Unit	Chronological order (From latest to the previous)	NAM policy • Open records • Secret records	The classification scheme used in the ministry is given by NAM and monitored by Record Officer in the ministry.
Record Keeping System				
1. What kind of recordkeeping systems does the department use?	DDMS (official) Own initiative (unofficial)	Electronic and paper based. DDMS (However, not all records capture in DDMS)	Chronology i. e-cabinet ii. e-parliament iii. paper record	Fully implement DDMS : Management Department (This is because Records Management Unit and Information Management Unit are under this department. Not fully implement DDMS : Operation Department (PIC is preferring paper based records) Not implement DDMS : Policy Department (One of the reason is because they have systems which currently used at the department but, some of the staff is using DDMS).
2. Which of the following recordkeeping systems does the department use?	<ul style="list-style-type: none"> • Paper registry system • Electronic registry system • Others: Document Management System (Only this division) 	<ul style="list-style-type: none"> • Paper registry system • Electronic registry system 	<ul style="list-style-type: none"> • Paper registry system / Manual registri sistem • Electronic registry system / Elektronik registri sistem • Others. Please specify / Lain-lain. Sila nyatakan. DDMS 	
• Paper registry system				

• Electronic registry system				
• EDRMS / Electronic Document and Records Management System				
• Others. Please specify				
3. What is the name of record keeping systems used in the department?	DDMS	DDMS	Previously e-cabinet Currently e-parliament	
4. Who is responsible in handling and managing the system?	Records Management Unit	2 administrative clerks 1 officer	Parliament officer	
5. How email records are managed in the department?	Captured in DDMS and following the Retention Schedule provided by NAM.	Print and email	Print File	
6. Which of the following systems are used to manage emails in the department?	<ul style="list-style-type: none"> • Email system: Outlook • DDMS • Others: Identity Provisioning & Management Services 	<ul style="list-style-type: none"> • Email System: Outlook • DDMS 	<ul style="list-style-type: none"> • Email System/ emel sistem (Outlook) • DDMS 	
• Email system				
• SharePoint				

• EDRMS / Electronic Document and Records Management System				
• Others. Please specify				
7. Does the department use any cloud services for managing electronic records?	Email and DDMS is using cloud, server is provided by MAMPU.	No	No	
8. What are the knowledge and skills needed in handling and managing the system?	Know how to use DDMS application Basic skills IT, web browser.	Basic computer skills	Basic computer background	
9. What are the specifications of hardware and software used in the system?	<ul style="list-style-type: none"> • OS: Window XP (minimum requirement) • Browser: Google Chrome • Internet access 	Any computer Any Operating system Flexible	Refer IMD	
Arrangement				
1. How is the email records been arranged in the department?	Refer Record Officer	Alphabetical order <ul style="list-style-type: none"> • Open access • Confidential 	Chronology by date (Following ISO)	Surprisingly they use the same Classification Scheme by NAM , but arranged it differently.

2. How the email records filing in the department?	Print-File-Registry	(dimasukkan) File it manually Classification number given by NAM	Print by desk officer File by clerk	
3. Who is responsible in arranging the email records in the department?	<ul style="list-style-type: none"> Records Management Department User decide which file to use. 	Administrative clerk	<ul style="list-style-type: none"> Desk officer Chief clerk Clerk 	
Storage				
1. How the email records have been stored in the department?	Cloud storage: can use own computer	DDMS and filing	Filing room	
2. Who is responsible in managing and handling the storage?	Registry: Records Management Unit Electronic: MAMPU	Clerk	Chief clerk	
3. What are the format requirements in storing paper based and electronic records in the department?	Computer desktop Internet Access Web browser Registry: Scanner DDMS : backup TIFF/PDF	Inward and outward correspondences Numbering Reference number	Standard ISO Guidelines by NAM Guidelines by MAMPU	
4. What are the issues in storing the email records?	If DDMS having technical problem Backup: Registry (paper based file)	Didn't upload in DDMS e.g : attachment	Physical :spacing Storage: the renting duration	

Classification				
1. What is the classification used in managing the email records in the department?	Refer Records Management Unit	Refer clerk	<ul style="list-style-type: none"> • Confidential • Secret 	
2. How classification of email records has been conducted in the department?	Refer Records Management Unit	Print and clerk action to determine the reference number.	Refer Record Officer	
3. Who is responsible in classifying the email records in the department?	Creator of the email	Officer on each unit	Desk Officer	
Access				
1. Who can access to the email records in the department?	Every owner of email account can access to their own email records DDMS: Open access	Every personnel can access Who needs the record	<ul style="list-style-type: none"> • Officer who is involved with the records • Desk officer 	
Maintenance				
1. Who is responsible in maintenance of email records in the department? / Siapakah yang bertanggungjawab dalam penyelenggaraan emel rekod di jabatan?	Record Officer	Clerk	<ul style="list-style-type: none"> • Chief clerk • Clerk 	

2. What are the strategies taken by the department and the ministry in maintaining the digital content? (back-up/recovery, refreshment etc.)	Internal storage as a backup storage which can be use externally through online.	No	Implementing DDMS by stages.	
3. What are the issues in maintaining the electronic record keeping system specifically email in the department?	Email captured in DDMS. If there is a technical problem for DDMS, the DDMS can't be accessed. Dependant on DDMS.	No	The ministry doesn't have their own hardware as for storage Staff need to do their own initiative in maintaining the email Email capacity storage is rely on position, the higher the position, the higher the capacity.	
4. How frequent the maintaining of electronic record keeping system in the department?	Refer MAMPU	No	Staff initiative	
Information Management Policies/ Guidelines/Risk				
1. Does the ministry have an Information Management policy? Yes/No 2. Is it available to the public? Yes/No. If yes, can you please provide a copy?	Specifically, No. However, there is a policy which focusing on ICT Security which handle by Information Management Division (this division)	No Just follow the ministry policy	Yes Yes Refer IMD (Ministry Strategic Plan)	

2. Does the ministry have an Information Security policy? Yes/No 4. Is it available to the public? Yes/No. If yes, can you please provide a copy?	Refer above.	There is no specific on the department Follow the ministry	Yes Yes Refer IMD	
3. Does the ministry have a risk management committee? Yes/No.	Yes, Service Continuity Plan Committee	Not for the department But do have for the ministry. There is representative for each department.	Refer IMD	
4. Does the ministry have an internal audit committee? 7. If yes, does the committee have a program of work? Who agrees the audit committee's program of work?	Yes, officer from National Audit Department Ministry Audit Committee	Management department	Yes Under Head of Secretary	
5. Does the ministry have external auditor? Who are they?	Yes, officer from National Audit Department (different from internal auditor) which report directly to Head Auditor of Malaysia	Implementation	Yes Officer from National Audit Department	
6. Who in the ministry acts as internal auditor(s)? What role/position are they?	There is internal auditor unit at the ministry. Other than that, there is an asset unit which the committee is the representative from	Management department	1st layer auditor	

	each unit and department.			
7. Does the ministry have risk register?	Yes	Yes	Yes Audit Section	
8. Is information on the risk register?	Yes. Data Recovery handled by Information Management Unit.	Yes	Refer IMD	
9. Who gives advice on record keeping in the ministry?	National Archives of Malaysia specifically the Record Officer.	Administrative section (supposedly)	External : NAM Internal : Management Department	
10. What types of advice do they give?	Records management , classification	Follow the guidelines	Record Keeping Procedure	
11. What are the policies in managing electronic records specifically email in the ministry?	More into guidelines and circular letter instead of policy.	No	JPICT Policy which provided by MAMPU	Circular letter of Implementing DDMS by Head of Secretary Malaysia

12. What are the guidelines in managing electronic records specifically email in the ministry?	The Guidelines of Managing Public Records DDMS Guidelines	No	Email Guidelines by MAMPU	DDMS Guidelines by MAMPU, Electronic Records Guidelines by NAM.

Appendix 21: Comparison Data among Operational Staff

Questions	OP1D1	OP2D1	OP1D2	OP2D2	OP1D3	OP2D3	Notes
Create							
1. What records are created or produced in the department?	<ul style="list-style-type: none"> • Email • Memo • Letter • Contract • Discussion notes 	<ul style="list-style-type: none"> • Slide • Act • Audio • Minute meeting • Meeting feedback • Email • The ministers paper • Policy • Circular letter • Newspaper cutting 	<ul style="list-style-type: none"> • Email (in and out, internal & external) • Inward & outward letter • Minute meeting 	<ul style="list-style-type: none"> • Email • Inward and outward correspondences (letter) • Memo • Minute meeting 	<ul style="list-style-type: none"> • Memo • Letter • Minute meeting • Notes of ministry department 	<ul style="list-style-type: none"> • Memo • Letter • Minute meeting • Notes of ministry department • Proposal • Slide presentation • Strategic plan 	
2. How email record is created in the department?	<ul style="list-style-type: none"> • Based on command from the top officer • As for communication medium • Own initiative when needed 	<ul style="list-style-type: none"> • Based on command from the top officer • Own initiative when needed 	Command (verbal or email) from the top officer Through secretary department	Command from the top officer	Email record: IMD prepared Each officer (grade 41 and above)	All individual	Email can be created by any individual who has email account, but to accept it as a record is depends on the authority of the creator.

3. Why emails are being created in the department instead of letter?	<ul style="list-style-type: none"> • Efficient • Formal communication • Paperless government 	<ul style="list-style-type: none"> • Efficient • Effective • Economy • Safe (direct to the recipient) • One of the government communication medium 	Immediate respond Early notice	Effective and efficiency	<ul style="list-style-type: none"> • Paperless • can notify the action taken (read or not) 	<ul style="list-style-type: none"> • Easy retrieve • Accessible by mobile • Urgent action (notify 24 hours) 	The action taken by using email is faster compared with letter. User can access to the email by using mobile or any telecommunication device which support browser and internet connection.
Capture							
1. How the email records been captured in the department?	<ul style="list-style-type: none"> • Email records: DDMS • Memo letter : scan -> email -> DDMS 	DDMS	Based on the instruction from the top officer	Print email Show to the top officer Minute and file it (She is responsible as a department secretary, so all the emails to the top officer, will be received by her)	<ul style="list-style-type: none"> • Email calling for meeting 	High level email : Determined by high level officer General email: decided by individual (officer)	The process of email capturing can be captured by using 2 methods photocopy and insert in a file with a detail and DDMS.

2. How the department capture the paper based and electronic format of record?	Print-File-DDMS	Electronic: DDMS Paper based: Registry The original signature	Top officer (PIC) decide which file to capture Open : Self decision Confidential: Top decision	Electronic: Print-file Paper based: Photocopy and file	Formal letter: Secretary department send to Personal Assistant (PA) PA will arrange and send to every section or receiver	Paper record: • File • Copy • Distribute Electronic Record: CC to administrative unit	Based on NAM and MAMPU guidelines, paper based records is need to be copy and file in a registry. Electronic records is capturing by DDMS.
3. How to identify the email records as evidence in business process?	Delivery Report Email account sender Following guidelines given by MAMPU & NAM. Circular Letter: No 1/2003	DDMS: Audit trail Email: transactional log (Date, sender, recipient)	Section secretary to PIC to clerk (to search for the file)	Command from head of department and accepted as a proof	Based on date and time Sender and receiver (Designation) Current practice: each email send need to CC HOD or higher officer as a proof	• Date • Time • Sender • Receiver • Contents • Title • CC	The audit trail and the format of email.
4. Why email records are identified as evidence in the department?	Based on circular	Formal email As a public record in daily formal task	Easy to trace received email records (audit trail)	Email has been used by the top officer, so it has been identified as evidence.	To make the process easier and depends on current situation	Command for calling meeting	

5. Who is responsible in capturing the email records in the department?	The owner of the account / recipient	<ul style="list-style-type: none"> • Every recipient need to capture by themselves • Sender 	<ul style="list-style-type: none"> • Record Officer Department • Administrative Record Clerk Department 	<ul style="list-style-type: none"> • Record Officer Department • Administrative Record Clerk Department 	<ul style="list-style-type: none"> • Administrative Clerk • Secretary Department 	<ul style="list-style-type: none"> • Administrative Unit • Personal Assistant Head of Department 	The sender or 1st recipient.
Tracking							
1. What is record tracking?	User can trace records based on file reference number as for the movement of file.	A system to identify the location of the file, who access the file and how many times the file has been referred.	To determine the recipient and who to referred	Every correspondences inward and outward (hardcopy/soft copy) need to be recorded	A system to trace records	A system for office management to monitor the movements of records	
2. Is there any record tracking in the department? Why record tracking is performed in the department?	Yes, to trace the movement of file.	Yes, The file movement, registration loaning file (log book), sending letter book, inward outward correspondences record system, attachment registration.	Yes. For internal department use: Easy to referred (Using Excel Spreadsheet) For ministry: DDMS	Yes, as evidence.	Yes. To trace the movement of records Log book inward /outward correspondences	Yes. To make the officer and staff to refer and record transaction	Log book for paper based records and DDMS. However, some of staff made Excel as a tracking record.
Registry							

1. Is there a registry system for paper records in the department?	Yes	Yes	Yes (Log book)	Yes	Yes. Log book inward and outward	Yes	
2. Is there a registry system for electronic records in the department	Yes (DDMS)	Yes	Yes (DDMS and Excel)	Yes	<ul style="list-style-type: none"> • Yes. DDMS • Under Parliament Section using Microsoft Word 	Yes	
3. What are the metadata (data represent) used in the registry system?	File Number	Descriptive metadata	<ul style="list-style-type: none"> • Title • Reference Number 	<ul style="list-style-type: none"> • Date • Sender 	<ul style="list-style-type: none"> • Letter Number • Date Received • File Number • Receiver • Title • Refer to whom 	<ul style="list-style-type: none"> • Date • Time • Sender • Receiver • CC • Title • Contents (Description) 	Descriptive metadata which have the main components like date, title and sender.
4. What is the classification scheme used in organizing the records in registry?	<ul style="list-style-type: none"> • Classification File • Chronological order 	Classification File Function & Activity	<ul style="list-style-type: none"> • Confidential (Depends on the project) • Open (File title) 	Chronological order	<ul style="list-style-type: none"> • Geographical • Open (chronology) • Confidential, Secret and Big Secret 	Open (Title) Confidential (Chronology) Secret (Chronology) Big Secret (Chronology)	Based on NAM and DDMS Classification File and Function activity.
Record Keeping System							

1. What kind of recordkeeping systems does the department use?	<ul style="list-style-type: none"> • Physical: File room • Electronic: Document Management System (only at this division) • DDMS 	Hybrid system	Paper based	File and electronic (DDMS)	<ul style="list-style-type: none"> • DDMS • Filing 	<ul style="list-style-type: none"> • DDMS • Filing 	Hybrid consists of registry and DDMS.
2. Which of the following recordkeeping systems does the department use?							
<ul style="list-style-type: none"> • Paper registry system • Electronic registry system • EDRMS / Electronic Document and Records Management System • Others. Please specify 	<ul style="list-style-type: none"> • Paper registry system • Electronic registry system • Others: Document Management System (Only this division) 	<ul style="list-style-type: none"> • Paper registry system • Electronic registry system • DDMS 	<ul style="list-style-type: none"> • Paper registry system • Electronic registry system 	<ul style="list-style-type: none"> • Paper registry system • Electronic registry system (Excel & DDMS) 	<ul style="list-style-type: none"> • Paper registry system • Electronic registry system • DDMS 	<ul style="list-style-type: none"> • Paper registry system • DDMS 	
3. Who is responsible in handling and managing the system?	DDMS: Record Officer	Record Officer Department	<ul style="list-style-type: none"> • Record Officer Department • Administrative Record Clerk Department 	<ul style="list-style-type: none"> • Excel: herself • DDMS and paper based: Record Officer Department and Administrative Record Clerk Department 	<ul style="list-style-type: none"> • Paper registry system (Clerk) • Electronic registry system (clerk) DDMS (IMD and Management Department) 	<ul style="list-style-type: none"> • IMD • Management Department • Administrative Unit 	

4. How email records are managed in the department?	Based on the guideline from NAM.	Electronic follow MAMPU guidelines Conventional follow NAM guidelines Electronic follow MAMPU guidelines Conventional follow NAM guidelines	<ul style="list-style-type: none"> • Print - secretary department read- file it • Secretary department read (minute) – selected officer - DDMS 	Own initiative	Print File	i. Receive ii. File iii. Print iv. Send to Clerk v. Coding vi. File	Based on NAM and MAMPU guidelines.
5. Which of the following systems are used to manage emails in the department?							
Email system <ul style="list-style-type: none"> • SharePoint • EDRMS / Electronic Document and Records Management System • Others. Please specify 	<ul style="list-style-type: none"> • Email system: Outlook • DDMS • Others: Identity Provisioning & Management Services 	<ul style="list-style-type: none"> • Email System • Others: Registry system 	<ul style="list-style-type: none"> • Email System: Outlook • DDMS 	<ul style="list-style-type: none"> • Email System: Outlook • DDMS • Email System: Outlook • DDMS 	<ul style="list-style-type: none"> • Email System/ emel sistem (Outlook) • DDMS 	<ul style="list-style-type: none"> • Email System/ emel sistem (Outlook) • DDMS 	
6. Does the department use any cloud services for managing electronic records? / Adakah jabatan menggunakan perkhidmatan 'cloud' bagi menguruskan rekod elektronik?	Yes, 1GOVUC.	Yes	No	Unsure	No	No	
Arrangement							

1. How is the email records been arranged in the department?	<ul style="list-style-type: none"> • Subject • Date 	<ul style="list-style-type: none"> • Function • Activity 	Chronological order	Chronological order	Print File	Print Coding File Arrange like letter Electronic Record : Unsure	Function and activity (chronological order)
2. How the email records filing in the department?	Print –File (According to Classification File given by NAM monitored by Record Officer)	Captured using DDMS Print and file at the registry	<ul style="list-style-type: none"> • Depends on the email contents • Determine the file according to the contents 	Head of department minute – file – disseminate to Administrative Record Clerk Department / selected officer	Filing manually using Filing Classification by NAM	Print Coding File Arrange like letter Electronic Record : Unsure	Captured using DDMS Print and file at the registry
3. Who is responsible in arranging the email records in the department?	<ul style="list-style-type: none"> • The account owner • File Officer at the unit. 	Owner or user of the email account	Administrative Record Clerk Department (No scanning or electronic record)	Individual itself	Administrative clerk	<ul style="list-style-type: none"> • Administrative clerk • Clerk 	
Storage							
1. How the email records have been stored in the department?	Cloud storage managed by MAMPU Physical: File room	Using DDMS and physical copy at registry	Keep it in a file	Print and file	<ul style="list-style-type: none"> • DDMS stored in server • Print and stored in filing room 	Store in individual folder Memo/letter : Scan, copy and send to officer	

2. Who is responsible in managing and handling the storage?	The Officer of the File Room	DDMS: maintained by MAMPU Conventional by Record Officer	Administrative Record Clerk Department	Record Officer Department and Administrative Record Clerk Department	IMD	Officer Head of Administrative Unit	DDMS maintained by MAMPU, registry by Record Officer
3. What are the format requirements in storing paper based and electronic records in the department?	<ul style="list-style-type: none"> • File • Inward and Outward log book • Window XP and above • Internet access 	Paper records: Shelves, pocket file, file box Electronic: scanner, computer, laptop, internet.	File Filing room	File Shelves Minute paper	Electronic record: Internet connection Paper based: File File Cover Can access decentralized	No specific requirement	
Classification							
1. What is the classification used in managing the email records in the department?	The guidelines for Managing Public Record	Following the Classification File by NAM	<ul style="list-style-type: none"> • Open • Confidential Both using chronological order	Following the Classification File given by NAM monitoring by Record Officer of ministry	Same as paper based record <ul style="list-style-type: none"> • Open • Confidential • Secret 	Same as paper based record <ul style="list-style-type: none"> • Open • Confidential • Secret 	Following the Classification File by NAM
2. How classification of email records has been conducted in the department?	Print and File according to the Subject and File Number	Function and activity	Depends on the contents (top officer will determine it)	Following the guidelines given	By research title	Guidelines by IMD	
Access							

1. Who can access to the email records in the department?	The owner of the email account The owner of DDMS account The Officer in charge of File Room	DDMS user	Every officer and clerk	Record Officer Department and Administrative Record Clerk Department	Each individual	Each individual	DDMS user
Maintenance							
1. Who is responsible in maintenance of email records in the department?	<ul style="list-style-type: none"> Record Officer Application Officer (Only for this division) 	Record Officer	<ul style="list-style-type: none"> Record Officer Department Administrative Record Clerk Department 	Administrative Record Clerk Department	IMD	Administrative Unit IMD	Record Officer